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Construction of Large-Scale Structural Base Maps of Central Edmonton for 1907, 1911 and 1914

by

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A THESIS
SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH
IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE
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ABSTRACT

As growing attention is being paid to our urban past, both locally and nationally, it seemed timely to establish the value of a highly regarded source of historical information, the fire insurance maps, in the Edmonton situation. This has been done by presenting the structual detail of the urban landscape, as recorded on the Edmonton fire insurance maps, in the form of large-scale structural base maps. Central Edmonton was adopted as the study area and base maps were constructed for the years 1907, 1911 and 1914, from corresponding fire insurance maps and a variety of supplementary sources. Information on various structural and land use characteristics were then displayed for buildings on the base maps, to illustrate the value of the base maps as a potential information source and research tool.

The methods developed in the production of the large-scale base maps were extended to years for which fire insurance maps were unavailable as a direct information source. An evaluation of the production of base maps for Edmonton in other time periods was also undertaken, and a base map of 1929 constructed to illustrate the use of these research techniques. The thesis concludes with a discussion of the possible benefits of large-scale structural base maps to historical urban research.

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Table of Contents

Chapter Page

1. INTRODUCTION 1
    - 1.1 Research Concepts and Procedures 1
        - 1.1.1 Introduction 1
        - 1.1.2 Thesis Objectives and Research Design 5
    - 1.2 Study Framework 8
        - 1.2.1 Selection of the Study Area 8
        - 1.2.2 Selection of the Study Period 9
    - 1.3 Presentation of the Thesis 10
2. LARGE-SCALE URBAN MAPS AND THEIR SCHOLARLY APPLICATIONS 13
    - 2.1 Introduction 13
    - 2.2 Large-Scale Structural Maps in Britain: The Ordnance Survey Map 13
    - 2.3 The Development of Fire Insurance Maps in Canada 16
    - 2.4 The Construction of Canadian Fire Insurance Maps 19
    - 2.5 Revision of Fire Insurance Maps 22
    - 2.6 The Use Of Large-Scale Fire Insurance Maps by Geographers 23
    - 2.7 Information Sources Used to Supplement Fire Insurance Maps 30
3. AN EVALUATION OF THE PRIMARY INFORMATION SOURCES USED IN THE CONSTRUCTION OF LARGE-SCALE STRUCTURAL BASE MAPS OF CENTRAL EDMONTON 33
    - 3.1 Introduction 33
    - 3.2 Fire Insurance Maps 34
        - 3.2.1 Features of Value to the Research and Construction of Large-Scale Structural Base Maps 34

3.2.2 Availability of Data Source 35

3.2.3 Problems Encountered in the Use of the Data Source 36

3.3 Henderson Directories 38

3.3.1 Features of Value to the Research and Construction of Large-Scale Structural Base Maps 38

3.3.2 Availability 40

3.3.3 Problems Encountered in the Use of the Data Source 40

3.4 Building Permits 42

3.4.1 Features of Value to the Research and Construction of Large-Scale Structural Base Maps 42

3.4.2 Availability 43

3.4.3 Problems Encountered in the Use of the Data Source 44

3.5 Photographs 45

3.5.1 Features of Value to the Research and Construction of Large-Scale Structural Base Maps 45

3.5.2 Availability 46

3.5.3 Problems Encountered in the Use of Data Source 47

3.6 City Newspapers 48

3.6.1 Features of Value to the Research and Construction of Large-Scale Structural Base Maps 48

3.6.2 Availability 49

3.6.3 Problems Encountered in the Use of the Data Sources 49

3.7 Architectural Plans 51

3.7.1 Features of Value to the Research and Construction of Large-Scale Structural Base Maps 51

3.7.2 Availability 51

3.7.3 Problems Encountered in the Use of the Data Source 52

3.8 Land Title Certificates 52

3.8.1 Features of Value to the Research and Construction of Large-Scale Structural Base Maps 52

3.8.2 Availability 53

3.8.3 Problems Encountered in the Use of the Data Source 53

4. CONSTRUCTION OF THE LARGE-SCALE STRUCTURAL BASE MAPS 54

4.1 Introduction 54

4.2 Construction of a Primary Base Map 54

4.3 Construction of the 1914 Primary Structural Base Map and Establishment of the Map Scale 56

4.4 Construction of the 1911 Structural Base Map 57

4.5 Construction of the 1907 Structural Base Map 63

4.5.1 Methods for Extracting Original Information from Revised Fire Insurance Maps 65

4.5.2 Construction of the 1907 Base Map When the Fire Insurance Maps Could Not Provide Total Structural Information 69

5. DEMONSTRATED USES OF LARGE-SCALE STRUCTURAL BASE MAPS OF CENTRAL EDMONTON 79

5.1 Introduction 79

5.2 The Production of the Building Use Map 79

5.2.1 Sources of Information 79

5.2.2 Building Use Classification 82

5.3 Building Characteristics Maps 84

5.4 Building Demolitions Map 85

5.5 Summary 86

6. THE DEVELOPMENT OF POSSIBLE RESEARCH METHODS TO EXTEND THE CONSTRUCTION OF LARGE-SCALE STRUCTURAL BASE MAPS TO YEARS FOR WHICH FIRE INSURANCE MAPS DO NOT EXIST 87

6.1 Introduction 87

6.2 Techniques and Procedures for the Construction of Large-Scale Structural Base Maps for Years between Two Complete Sets of Fire Insurance Maps 1914-1953 90

6.3 Conclusion 99

7. CONCLUSION 100

7.1 The Practicability of Constructing Large-Scale Structural Base Maps for Previous Time Periods .100

7.1.1 Edmonton pre-1907 100

7.1.2 Edmonton 1914 to Present 101

7.1.3 The Time Required to Produce Large-scale Structural Base Maps 103

7.2 Storage and Use of Thesis 104

7.3 Possible Benefits of Large-Scale Structural Base Maps to Historical Urban Research 105

BIBLIOGRAPHY 108

APPENDIX Omission of Rail Spur Lines on the 1914 Base Map 115

LIST OF FIGURES

Figure Page

2.1 A portion of the Chas E. Goad Co., Map of Edmonton, Vol 1, sheet 19 February 1907 revised to December 1911 20

4.1 Large-Scale Structural Base Map of Central Edmonton 1914 (August) 58

4.2 Large-Scale Structural Base Map of Central Edmonton 1911 (December) 60

4.3 Large-Scale Structural Base Map of Central Edmonton 1907 (February) 64

5.1 Ground-Floor Use 1907 (Spring) . . . . *

5.2 Ground-Floor Use 1911 (December) . . . . *

5.3 Ground-Floor Use 1914 (August) . . . . *

5.4 Above Ground-Floor Use 1907 (Spring) . . . . *

5.5 Above Ground-Floor Use 1911 (December) . . . . *

5.6 Above Ground-Floor Use 1914 (August) . . . . *

5.7 Building Height 1907 (February) . . . . *

5.8 Building Height 1911 (December) . . . . *

5.9 Building Height 1914 (August) . . . . *

5.10 Building Materials 1907 (February) . . . . *

5.11 Building Materials 1911 (December) . . . . *

5.12 Building Materials 1914 (August) . . . . *

5.13 Demolition of the 1907 Building Stock . . . . *

6.1 Large-Scale Structural Base Map of Central Edmonton 1929 (December) 88

*Figure located in back pocket.

1. INTRODUCTION

1.1 Research Concepts and Procedures

1.1.1 Introduction

The chief purpose of this thesis is to construct large-scale structural base maps of central Edmonton for the years 1907, 1911 and 1914 from corresponding fire insurance maps and a variety of supplementary sources. As a secondary purpose, the methods developed in this map construction will be extended to encompass years for which fire insurance maps are not available. Since the fire insurance map represents the only complete structural record for much of the early 20th century for most North American cities, it has become an invaluable source of information for those engaged in historical urban research. In Hayward's (1974, p.67) words: "Historical researchers interested in morphological changes, urban land use, architecture and urban demography all find these plans useful, if not essential, to their studies." To date, the Edmonton fire insurance maps have not received close examination. However, with growing attention being paid to our urban past both locally and nationally, as exhibited by an increased volume of published material on the subject, it seemed timely to establish the value of this highly regarded source of historical information in the Edmonton situation.

In this thesis the structural detail of the urban landscape, as recorded on the fire insurance maps, is retained and presented in the form of large-scale structural base maps. Within the framework of the road and rail networks, these maps present the ground-level layout of buildings at a scale that allows for their individual representation. The justification for producing maps of this kind is to be found in their potential role as a historic information source and research tool, both in terms of the recorded structural detail of the large-scale maps themselves, and in the additional information which they can be used to display.

Urban historical researchers may utilize the structural base maps of central Edmonton in a variety of ways, depending upon their particular needs. As information sources in their own rights the maps provide a means to review such items as building size, their spatial arrangement in relation to other buildings, and actual building layout. These maps can also be used to analyse structual changes over time. The comparison of maps for different years will yield the location and extent of all structural changes, such as street realignment, building construction or demolition, and the reparcelling of land into building plots.

Information pertaining to individual buildings can also be compiled and stored on the base maps, allowing them to become an information source of the researcher's choosing.

This enhances the possibilities for information analysis, both from the standpoint of the variety of subjects that can be addressed, and because of the benefit of having information in a graphic form which permits spatial distributions and relationships to be viewed quickly and easily. The large-scale representation of all buildings in this map form also provides the option of studying individual buildings at a micro-scale or at some larger scale, through aggregation.

In addition, large-scale structural base maps provide a medium through which information obtained in various forms from diverse sources, such as photographs, newspapers and building permits, can be combined and represented in a singular form. This consolidation of information from scattered sources should aid in historical research, as few sources in this field provide the complete information desired. They must normally be supplemented from a variety of other sources.

The problem of incomplete data is compounded when urban historical researchers confront, as they must, the need to understand changes over time. As Baker (1975, p.11) states, problems of "temporal coverage are common throughout geography because of the chance nature of document construction and survival." In terms of the structural record of most North American cities, insurance maps have proven to contain the most complete record of the structural landscape. However, their temporal coverage tends to be erratic, since there are irregular and often large gaps between successive sets of fire insurance maps. It is therefore necessary to develop methods for large-scale structural map production that allow the most serious of these gaps to be closed. The result would be to make available a new information source in large-scale map form, extending much of the information contained on the periodic fire insurance maps to those years for which a detailed mapped record has not previously existed.

The ability to construct large-scale structural base maps for any particular year, depending upon the availability of reliable information, opens the potential to undertake a variety of time-related studies. More specifically, these new structual base maps could meet some of the research needs of organizations that carry out historical urban research. In particular, they could be of value to government agencies concerned with the preservation of our building heritage or planning with heritage in mind. An essential part of heritage conservation is the identification of buildings that are of signficant importance to the community. Baker (1975, p.1) states that a "specific application of historical geography to today's problems lies in the identification of legacies in the landscape, which might be designated as outstanding historical-geographical interest and appropriately conserved." Large-scale structural base maps could be used in such a task, when the appropriate building information is included. By constructing a number of structural base maps for selected years, building identification can become easier, as the changes affecting each building can be traced through time. It is thus possible to gain a greater understanding of a building's history and the environment in which it was situated.

A side benefit in reconstructing a structural landscape for a date for which fire insurance maps do not exist, is the wealth of information uncovered during the preparation of the map. Detailed examination of many buildings is required to reconstruct an area as a whole for a structural base map, so opening the possibility of discovering relationships among buildings (ownership, tenants, contractors, building materials, and so on) that in all likelihood would not have been revealed when single buildings were studied in isolation. Hence, the map preparation exercise itself is likely to be a valuable way of gaining new insight into a city's character at particular stages of development. This applies both when fire insurance maps are unavailable and, to a lesser extent, when large-scale base maps are produced directly from fire insurance maps.

1.1.2 Thesis Objectives and Research Design

The primary objective of the thesis is to produce large-scale structural base maps of central Edmonton for 1907, 1911 and 1914, the first three years for which fire insurance maps are available. The research methods developed in the production of these maps will be described, and their utility will be demonstrated by using them to illustrate selected characteristics of structural and land use change in central Edmonton over the periods 1907-11 and 1911-14. The secondary objective of the thesis is to extend this line of research by developing methods for the preparation of large-scale structural base maps of central Edmonton for those years for which fire insurance maps are not available, particularly between 1914 and 1953, when the maps that provide the last base year for this study were eventually replaced.

To accomplish the objectives outlined, the thesis has been designed around the following sequence of steps:

1. Identify the specific information sources that are of particular use in producing a map depicting the structural features of an urban landscape and evaluate these information sources in terms of their perceived value for large-scale structural base map construction. This would encompass such factors as temporal coverage, spatial coverage, accuracy, and the form and detail of information provided. Although this is the first step in the research procedures, much of the evaluation of the information sources had to be undertaken in conjunction with the actual production of the base maps.
2. Devise methods of map construction, as the compilation of the base map proceeds for each map year, in

conjunction with the specific information sources being utilized.

3. Compile information on various structural and land use characteristics for the buildings of central Edmonton and determine how this information will be displayed upon the base maps.
4. Determine sources of information on structural changes for the years beyond those previously mapped, up until 1953, the next year for which a complete set of fire insurance maps is available, in order to establish possible means of constructing large-scale structural base maps for years in which fire insurance maps do not exist.

In summary the thesis will provide a set of three large-scale structural base maps for 1907, 1911 and 1914, as well as a detailed description of the methods used in their construction and a review of the information sources which made their construction possible. In addition, various aspects of land use and building characteristics of central Edmonton will be illustrated with these maps, and the thesis will set out means for extending map construction to years for which fire insurance maps are not available.

1.2 Study Framework

1.2.1 Selection of the Study Area

The study area is focused upon the commercial centre of Edmonton and its immediate surrounding area, as it existed during the period 1907 to 1914. Today, this area is bounded on the west by the Canadian Pacific rail line and yards on 110 Street, on the east by 96 Street, on the south by 100 Avenue, and on the north by the Canadian National yards and lines north of 104 Avenue.

The study area encompasses the whole of Edmonton's central business district and most of the newly emerging warehouse district of the early 1900's. This area was chosen largely for its structural complexity, a feature thought to best satisfy the requirements of the thesis objectives. This structural complexity was expected to provide the greatest test to the development of research techniques for the production of large-scale base maps for Edmonton. Due to the higher building densities, and the greater variation in building size, layout and physical arrangement, as compared with other districts of Edmonton, a greater degree of difficulty was anticipated in the research for the base maps. This difficulty was further compounded by the rapid structural changes which occurred in the building stock during the period of study.

A further reason for the selection of the study area is to demonstrate the structural detail of the large-scale base maps and a number of their potential uses. This is best accomplished through the mapping of a structurally diverse area, such as the city centre, where a wider variety of structural information is available for illustration. The central study area also tends to be of more interest to urban historical researchers than other parts of the city, and to have the greatest concentration of prospective heritage buildings.

1.2.2 Selection of the Study Period

The period of study encompasses the years 1907, 1911 and 1914 specifically, and more generally the years between 1914 and 1953.

The choice of 1907, 1911 and 1914 as the years for which actual maps are to be produced for central Edmonton reflects the availability of the primary data source, the fire insurance underwriters' maps, which provide the most nearly complete structural record of the built environment of the time. Two sets of fire insurance maps cover Edmonton's early development, one for 1907, revised to represent 1911, and one for 1913, revised to represent 1914. From these it was a straightforward task to construct structural base maps for 1911 and 1914. The 1907 map was much more difficult to construct, because it was necessary to work backwards from the revised map of 1911 and to consult a variety of supplementary information sources. In essence, the process was one of restoring the original 1907 fire insurance map by deleting the alterations that had been made between 1907 and 1911.

Another advantage to concentrating on the years between 1907 and 1914 is that it represented one of the greatest periods of structural change in central Edmonton's history. It was a time of rapid expansion, and of active construction and demolition of the building stock. As a study period, therefore, it was expected to provide a valuable test of the development of the research techniques needed for base map construction, as well as demonstrating to a challenging degree the base map's ability to highlight structural changes within the urban landscape.

After 1914 no further fire insurance maps were found for Edmonton until 1953. This portion of the study period therefore afforded the opportunity to examine the research techniques by which this gap of almost 40 years in the structural record could be filled. In effect, the method of supplementary data collection that was developed for the main study years was expanded to become the primary method, using the established maps which could be constructed for 1914 and 1953, as the foundation on which to construct large-scale base maps for the intervening years.

1.3 Presentation of the Thesis

Chapter 2 addresses the primary data source, the large-scale fire insurance maps, examining their Canadian history, manner of construction and content, as well as their expanding use in urban research. In addition, there is a brief discussion of the large-scale British Ordnance Survey maps and their use for historical research purposes. Chapter 3 undertakes an evaluation of the primary data sources as they relate to the production of large-scale structural maps, both for the maps actually produced in this thesis, and, more generally, for the construction of large-scale maps when fire insurance maps are not directly available. The rationale behind the system adopted for the construction of large-scale base maps is outlined in Chapter 4, along with the research methods used in determining the structural layout of buildings with the varying information conditions encountered for the primary study years, 1907, 1911 and 1914. Chapter 5 illustrates a number of ways in which information can be displayed and research undertaken using the newly-produced structural base maps. In the process, a detailed presentation of some of the changing building and land use characteristics of central Edmonton is provided.

In Chapter 6, the research methods developed to construct the structural base maps are expanded and applied to those years for which fire insurance maps are not available for Edmonton. Research techniques and mapping procedures for the compilation of large-scale base maps for the years between 1914 and 1953 are also outlined. In the final chapter, the practicability of constructing large-scale structural base maps from previous time periods, both for Edmonton and for urban areas in general, is assessed. The thesis concludes with a discussion of the possible benefits that the production of these maps could bring to urban research.

2. LARGE-SCALE URBAN MAPS AND THEIR SCHOLARLY APPLICATIONS

2.1 Introduction

The purpose of this chapter is to examine the development, construction and use of large-scale structural urban maps that have been of particular value to scholars studying the urban past. The two kinds of maps that were found to be most highly valued and widely used were the ordnance survey maps in Britain and the fire insurance maps in North America. Both have received acclaim from scholars for their detailed depiction of the structural features of the built environment. These maps have also been used in similar ways in historical urban research, though the ordnance survey maps have been used longer and with more thoroughness. As a result, the work which has been carried out with the ordnance survey maps has better demonstated the potential uses and value of large-scale structural maps in historical urban research. It was for this reason that a brief discussion of the ordance survey maps was included before the main review of the primary information source for this thesis, the fire insurance maps.

2.2 Large-Scale Structural Maps in Britain: The Ordnance Survey Map

The British ordnance survey maps were originally produced for military use almost 200 years ago, initially at a scale of 1 inch to 1 mile. Their value was soon recognized by the civil authorities who prompted the production of a larger-scale version at 6 inches to 1 mile, for taxation purposes. By the 1850's there was pressure to increase the scale once again. According to Dickinson (1979,p.119), "Maps of this kind were certainly much in demand from bodies concerned with activities as varied as urban building, mineral exploration, land registration and conveyancing, tith commuting or the laying of land drainage, water mains, sewers and railways." A new scale of 1:2500 (approximately 25 inches to 1 mile) was adopted in 1856 for the complete mapping of Britain, except for the moorland and mountainous areas, where the smaller scale was retained. In urban areas maps produced at 1:2500 depicted structural features such as the outer walls of buildings, hedges, roads, railway lines, as well as major land uses.

For a period between the late 1840's and the mid 1890's the Ordnance Survey produced maps at a scale of 1:500 for towns with populations greater than 4,000. During this period over 400 towns were mapped at the largest scale ever to be used by the Ordnance Survey. These maps displayed a high degree of detail of the urban landscape, right down to the identification of gardens and trees. Because of their high cost, their production was relatively short-lived.

In addition to the variety of map scales used by the Ordnance Survey over its long history of map production, changes have been made to the material presented on the maps. The length of time over which maps have been produced, and the numerous revisions that have been undertaken, has made the large-scale ordnance survey maps a valuable research source and tool, especially for urban studies.

Perhaps the best-known scholar to make extensive use of ordnance survey maps in historical urban geography has been M.R.G. Conzen. In his study of the urban morphology of Newcastle upon Tyne, Conzen took advantage of successive editions of ordnance survey maps to trace the city's development over a period of almost 200 years. In his article "The Plan Analysis of an English City Centre", he established (1962,p.383) the principle that "among the three aspects of the townscape accessible to direct observation, ie *town plan*, *building types*, and *urban land use*, the [first] is of fundamental importance in providing the basic framework." The town plan, in turn, he defined as "a combination of three distinct but integral kinds of *elements*: the *streets*, and their street system, the *plots* and their plot pattern, and the *building arrangement* within these patterns."

Even before his study of Newcastle, Conzen completed an immensely detailed analysis of Alhwick, Northumberland which Whitehand (1981,p.12) claimed "was to prove itself the major contribution to urban morphology in the English language in the post-war era." Whitehand (1982,p.12) contends that one of the achievements of Conzen's study, besides the establishment of principles of urban morphology and his evolutionary approach to its study, was "the use of detailed cartographic analysis (especially employing large-scale plans) in conjunction with field survey and documentary evidence." It was the use of large-scale maps and complementary information sources that made Conzen's evolutionary approach to the study of urban morphology possible. This, wrote Conzen (1960,p.7), consisted of "tracing existing forms back to the underlying formative processes and intepreting them accordingly." The "evolutionary patterns are assembled by utilizing such sources as rentals, building plans submitted in connection with application to build, and large-scale printed and manuscript plans for past periods, in association with detailed plot-by-plot and building-by-building field surveys that include the recording of detailed topographical information on large-scale ordnance survey plans" (Whitehand 1981,p.13).

2.3 The Development of Fire Insurance Maps in Canada

Fire insurance maps first came into use in England at almost the same time as the ordnance survey maps, but for a purely civil purpose. Their original development can be traced to the mid eighteenth century, when "London fire offices discovered the value of supplementing descriptive notes on properties insured with small sketchy surveys" (Hyde 1980, p.107). This early practice eventually progressed to city-wide mapping of all London buildings by the late eighteenth century, and thus can be seen as a forerunner of the insurance map. As Hayward (1974,p.51) has explained: "This highly specialized cartographic product grew out of the need of fire insurance underwriters to understand the physical characteristics of a structure to be insured and the spatial concentration of policy holders so as to limit a company's losses in the event of a conflagration."

The use of fire insurance plans in Canada dates to the early nineteenth century, when a number of Canada's largest settlements were mapped by an English insurance company. At this time, writes Hayward (1977,p.ix), the plans were "hand-drawn by an insurance company's surveyor for the exclusive use of the company."

Over the next half century in Canada, there were dramatic changes in fire insurance map production. With an advance in the map reproduction techniques by the 1850's, "faster and more economic reproductions" of fire insurance plans were possible, and "printed plans came into general use"(Hayward 1977,p.x). As well, changes were occurring in fire insurance mapping, with the emergence of mapping companies which assumed the tasks of preparing and producing the plans and distributing them to the fire insurance companies.

A major development in the history of fire insurance map production in Canada ocurred in the mid 1870's, when the American firm of D.A. Sanborn Company entered the Canadian market and introduced a more systematic and standardized approach to insurance plan production. Yet, within a few years of establishing itself in Canada, the company sold all the surplus copies of its Canadian plans to Charles Goad. "In effect, Goad bought out Sanborn's Canadian interests" (Hayward 1974, p.55). Goad had begun his own mapping of Canadian towns shortly after the Sanborn Company began mapping in Canada, and was in the process of revising some of the Sanborn maps when he aquired the company's stock of plans in 1878. Over the succeeding decades, Goad expanded the mapping of Canadian cities and towns, using the same basic format as the Sanborn maps. "By the time of his death in Toronto in 1910 Goad had extended his series to include approximately 1,300 places in Canada" (Hayward 1974, p.56). The Goad Company ceased to produce plans by 1918, "but continued to exist until 1930 when it had finally disposed of its stock of original plans" (Hayward 1977, p.xi). At this time various insurance underwriters' associations across Canada assumed their production and revision. In 1960 the regional operations amalgamated and the production of fire insurance plans was centralized under the Plan Division of the Canadian Underwriters' Association. In 1975, "due to ever-increasing costs and a limited demand, the Insurers' Advisory Organization ... decided to cease plan production and to sell its inventory of plans" (Hayward 1977, p.xii).

2.4 The Construction of Canadian Fire Insurance Maps

The manner of fire insurance map construction was dictated by the purpose for which these maps were produced, which was to aid insurance underwriters in the determination of building insurance rates, in relation to the potential fire hazards. For this reason the plans typically recorded, within the street pattern of the community, the shape, size and exact location of individual buildings, along with information on construction materials (stucco, brick, wood, etc.), the number of storeys, peculiarities of chimney, roofing and outlet pipes, and the use of the building. The locations of all fire hydrants and fire alarm boxes were also included. In short, "anything which might have a bearing in assessing risk" was mapped (Woodward 1974,p.8).

To convey the detailed information required by the insurance underwriters, up until 1950 fire insurance maps in Canada were usually drawn at a scale of 1:600 or 50 feet to an inch(Figure 2.1). Smaller scales were used only where large-scale mapping would have been impracticable, notably in areas where building density was low and the area to be mapped was large. At whatever scale, the map sheets were printed back to back,in a standard format of 21x25 inches (52.5x62.5 cm), and bound in book form.

The detailed structural information recorded for each building was displayed by a variety of symbols and colours. An extensive legend provided symbols for all manner of structural detail. This included window openings, wall

Figure 2.1 A portion of the Chas E. Goad Co., Map of Edmonton
Vol. 1, sheet 19, February 1907 revised to December 1911.
Source: Edmonton: Provincial Archives of Alberta
Acc. No. 65.124/22

partitions, roof covering material, elevators, wall thickness and so on. The use of these symbols allowed a great amount of detail to be recorded within a small area, and in a form that allowed the information to be easily and quickly retrieved. In addition, a colour coding system permitted the building material of each individual building to be identified at a glance. The colours employed tended to be representative of the materials represented, for example, red for brick, yellow for wood and blue for stone.

Building use is another feature represented on the fire insurance maps. The use or uses (if there was more than one) of all public and commercial buildings were listed, usually within the building outline. Single-family residences were also denoted, although their out buildings, and buildings with no specific use did not always receive a use listing. Since the maps were produced for the assessment of fire risk, the greater the risk associated with the use of the building, the greater the detail that was given. This is clearly illustrated in the case of large warehouse buildings, where the materials housed on each individual floor might be listed in detail. To note these varied uses a system of abbreviations was employed, as map space was limited, especially for smaller buildings.

Items that were not specially important to the assessment of fire risk, but were important in determining proper building identification, were also recorded in most cases. These included street addresses, building lot and block numbers, as well as the occasional building name.

2.5 Revision of Fire Insurance Maps

To remain of value to the fire insurance underwriters, fire insurance maps needed to be kept current. This was difficult, as changes were occurring continually in the building stock and the maps soon became out of date. A system of limited revisions was developed whereby the specific site that had undergone a change was updated, and a totally new map did not have to be printed. These revisions were made by issuing correction slips that the user had to paste onto the plan. The correction slips were produced at a size larger than the area of correction, to provide reference points to ensure their proper alignment when they were pasted in place. Revisions continued in this fashion until "the layers of correction slips began to interfere with the legibility and the accuracy of the plans" (Hayward 1977,p.xii), at which time a new, completely up-to-date book of maps for the community would be issued. The process of limited revision would then begin once again.

There were instances when the number of changes were so great on an individual map sheet between periods of revision, that a single correction slip would be issued to cover an entire map sheet. An example of this kind can be found in the 1907 fire insurance book of Edmonton.

A new system of map revision began in the early 1950's to accompany a new style of fire insurance book then being issued by the Underwriters' Survey Bureau's. It was in the form of a loose-leaf binder, with smaller map sheets measuring 12x13 inches (30x32.5 cm). "The new size and advanced printing techniques permitted the printing of individual sheets"(Hayward 1977,p.xii). As a result when extensive change was needed on an individual map sheet, it was replaced by a totally revised page. The fire insurance book would then be denoted as "Partially revised".

Today, only a limited number of past fire insurance maps appear to have survived. The reason appears to be the system employed by the map producers to limit their availability to paying subscribers only, so as to prevent their use by others, who would not be paying part of the production costs. As Hayward (1977,p.xii) explains:

> Because the plans were intended for subscribing insurance companies and their agents, the plans were printed in limited number, usually in runs of less than 150. Furthermore, because the plans were only loaned to subscribers on a long term basis, the insurance companies were obliged to return the plans once they ceased to be of use to them. Upon their return to Goad's office and later to the Underwriters' Survey Bureau, the plans were destroyed.

2.6 The Use Of Large-Scale Fire Insurance Maps by Geographers

In recent times, fire insurance maps have been used by scholars from various disciplines in a variety of ways far removed from their original purpose. Over the last few decades in particular, there has been an increased interest in this large-scale map form, accompanied by a growing awareness of its potential use and value, especially in the field of urban historical research.

The earliest noted instance of an alternative use of North American fire insurance maps dates to the early 1930's. William Applebaum, a pioneer in marketing geography, used Sanborn fire insurance maps as one of his primary data sources in the construction of combined population and urban land-use maps of Cincinnati. In his article "A Technique For Constructing a Population and Urban Land Use Map", Applebaum described the detailed features of the Sanborn fire insurance maps and their value as a source of accurate, up-to-date information for mapping purposes. It was the currency of the maps that made them a useful research tool for Applebaum.

Similarly, in an article published in 1949, Robert L. Wrigley Jr. wrote about the advantages of utilizing current fire insurance maps, extolling their value as a land use information source, particularly for city planning. Wrigley (1949, p.216) stated, "The map is used widely by city planning departments and by public and private organizations interested in details of urban land use" and is useful to others studing urban land use. In the United States, the Sanborn Map Company responded to this increasing use of their maps by outside groups by creating a Special Services Division "to meet the demand for special purpose maps and for the particular kinds of data and data analysis the Company was ideally equipped to provide" (Vicero 1971, p.49). A similar service was not provided by Canadian fire insurance map producers.

These early American articles indicate that the fire insurance maps were initially seen as a current information source, primarily for land use mapping and land use research. The first sign of a change appeared in an article by Robert B. Lamb(1961), "The Sanborn Map: A Tool for the Geographer". He reaffirmed the previously stated view of these maps, describing how various government and planning agencies had long found them useful, but he went on to state that geographers and geography departments could also find them of use. In particular, he suggested that old fire insurance maps could be acquired, their correction slips removed, and the uncovered maps used to "make comparisons and change studies" (Lamb 1961, p.22). This is the first indication that the fire insurance maps could possibly be used in historical research.

In the years that followed,expanding use was made of fire insurance maps in urban historical studies and analyses of change over time. An early Canadian application was demonstrated by M.J. Bannon (1967) in his study of the changing land uses of central Edmonton between 1946 and 1966. The city fire insurance map was one of the sources that he consulted to determine the floor area of buildings.

In the United States during the early 1970's a number of articles clearly illustrated the changing role of the fire insurance map as a research tool. One of the most notable was by Martyn J. Bowden. He set out to establish the boundaries of San Francisco's central business district in 1850, 1906 and 1931, by locating specific land uses associated with the CBD and determining their floor area. This task required the examination of every building within the area of the city centre. To establish the 1931 boundary, Bowden(1971,p.125) turned to the Sanborn fire insurance maps, which he found to "provide all the necessary information on morphology" and to be "perhaps the best source for morphologic reconstruction in most American cities in the last 75 years." By "morphologic reconstruction" Bowden(1971,p.125) meant the ability "to determine the location, ground-floor-area, height and number of stories, and the total floor space of each building." In the San Francisco case Bowden had to work from a 1929 fire insurance map, and did not mention how the information was updated to represent 1931 accurately. Some land use information was also extracted from the fire insurance maps, though Bowden relied more on city directories for that aspect of his research. The delimitation of San Francisco's CBD for 1906 and 1850 proved more difficult, as Bowden was not able to find fire insurance maps for those years. He therefore had to rely upon a variety of other sources to reconstruct the urban morphology and land uses. His techniques of reconstruction illustrate the difficulies confronting a researcher when fire insurance maps are unavailable, but they also establish that reconstruction is possible.

Stanley H. Ross presented a more straightforward use of past fire insurance maps in an article in which he analyzed central Mexico City in "terms of the Sanborn data to reflect street patterns, the buildings, and the utilization of the buildings"in 1906 (Ross 1971, p.32). Ross produced a set of accompanying maps that were developed entirely from information gathered from the fire insurance maps. These maps,which illustrated only the street layout and provided no outline of building form, displayed generalized information about building materials, building heights, retail establishments, and the ground-level uses of city buildings. Ross (1971, p.38) stressed the importance of fire insurance maps "as a research tool in the study of urban landscapes of the past", and observed, with reference to the Mexico City case, that the "data from the maps form an important source of information heretofore unreported."

The usefulness of the fire insurance map to historical geographers was further reinforced by Ralph D. Vicero in 1971. Since "map coverage does extend back through time and frequently into the late nineteenth century," wrote Vicero (1971, p.49), "historical geographers interested in the urban scene have available a potentially valuable research tool." He also noted (1971,p.51) that in "studies involving the urban morphology of the past--whether this be the recent or more distant past--there is no doubt that the Sanborn maps can be used profitably for a variety of research objectives."

Over the period of the mid 1970's and the early 1980's fire insurance maps gained wider acceptance among researchers as a valuable information source, but few studies based on data obtained from fire insurance map analysis were published. Two by geographers, Lay James Gibson and Robert A. Sauder, demonstrated a further extension in the use of fire insurance maps. In the first, Gibson investigated the commercial base of Tucson from 1883 to 1914, using as his data source Sanborn fire insurance maps for 1883, 1904 and 1914. These maps were used to construct three land use maps, one for each of the three years, illustrating the location of land use by symbol only, on a base map depicting city streets and blocks. A comparative analysis of these maps was then undertaken, to determine the composition and spatial pattern of Tucson's commercial building base. Over a period during which Tuscon's population doubled, the study traced the expansion of commercial buildings, their functional changes (increasing functional complexity, the changing dominance and groupings of certain functions), and the relationship to the locational changes from one point in time to another. Thus, Gibson's article was a further demonstration of the value of fire insurance maps in carrying out time-related studies.

The stated objective of Robert A. Sauder's article, which was a case study of Boston's waterfront, was to demonstrate the value of older Sanborn fire insurance maps. These, according to Sauder (1980,p.204), "are of considerable value for the historical geographer, not only for their age but also for their detailed portrayal of street patterns, lot lines, and the placement, size, shape and use of buildings." He then illustrated "their use in the reconstruction of geographies of the past" in a series of four maps. These corresponded with the Boston fire insurance maps of 1867, 1895, 1929 and 1972, and portrayed the changing character of Boston's downtown waterfront. Sauder's maps depicted streets, wharfs and general land use, though the actual ground form of the buildings was excluded. From the information presented on these maps, a comparative analysis was made of changes over the three successive periods, pertaining to adjustments in land uses and the effects of changing transportation modes on the study area, as well as a variety of other aspects of urban growth.

In undertaking the Boston study, Sauder emphasized the importance of such time-related reconstructions, especially in regard to preservation planning for urban areas. "By reconstructing and interpreting geographic pasts geographers can shed light upon the evolution of the physical present and the character of ongoing change" (Ford 1979,p.2), this being accomplished through the use of fire insurance maps which "facilitate the reconstruction of past situations" (Sauder 1980, p.213).

2.7 Information Sources Used to Supplement Fire Insurance Maps

Although fire insurance maps provide the single most-nearly complete record of past structural conditions, it is not always possible to rely on them alone, particularly when the available maps do not correspond exactly to the dates for which the reseach is being conducted. A variety of other source materials have therefore been used in reconstruction studies. Their success depends to a high degree on the availability of complete, reliable information and the time frame of the analysis.

As one example, in Bowden's study of San Francisco a reconstruction of the central portion of the city was attempted for 1906 and 1850, years for which fire insurance maps were unavailable. For the reconstruction of 1906 Bowden(1971,p.126) used a number of sources, although he relied most heavily on an illustrated directory of 1894-1895, "comprising views of business blocks, with reference to owners, occupants, professions and trades, public buildings and private residences." For the approximately 25% of the street frontage that he could not identify, as well as to update the 1894-1895 information, "photographs, engravings, lithographs, and sketches of panoramic views of the city, its streets, and its buildings, were ... used to fill the gaps left in the morphology by *The Illustrated Directory* and to bring the record of morphology up to 1906." The 1850 reconstruction was even more difficult. Beginning with a base map depicting only streets and blocks, Bowden was able to reconstruct about 75% of central San Francisco for June-July 1850 by working back from sources available only for later dates. Since there were no photographs, engravings or lithographs for the actual study year, Bowden consulted whatever he could find for later years, beginning with the early 1850's. He (1971,p.126) found that "it proved possible to work back from this material to a reconstruction of most of the buildings that existed in the summer of 1850." Bowden particularly stressed the value of newspapers and directories in this kind of morphological reconstruction, and reviewed their importance as information sources.

L.D. McCann's study of the conversion and redevelopment of dwelling units in Edmonton also entailed reconstructing the past. To trace changes in the use of individual buildings from 1921 to 1971, McCann relied chiefly upon tax assessment records which provided him with data on land use, building, land and ownership characteristics. Problems with this source were encountered when it was found that some records for older properties (pre-1951) had not been preserved, making it necessary for McCann (1971,p.128) to "estimate the dwelling's age and other characteristics from available assessment records, air photos, street directories, and comparison with adjoining properties." This information problem was found to be most prevalent in the older residential areas of the central city. Maps that

McCann produced for his study did not depict individual buildings or properties, although information on each building had to have been collected. Certainly, in his M.A. thesis "Processes of Change in Residential Areas in Transition"(1969) McCann produced a number of maps depicting land use by individual lot over a number of time periods.

This prior research was of direct value to the thesis design, since it was known in advance that the fire insurance maps of central Edmonton could not provide all the structural information that was needed to construct the large-scale base maps, especially for 1907. Bowden's study of San Francisco in particular, and to some degree McCann's study of Edmonton, provided direction in the selection and use of supplementary sources.

3. AN EVALUATION OF THE PRIMARY INFORMATION SOURCES USED IN THE CONSTRUCTION OF LARGE-SCALE STRUCTURAL BASE MAPS OF CENTRAL EDMONTON

3.1 Introduction

A variety of information sources were consulted in the production of the large-scale maps depicting the structural features of central Edmonton. The chief information source, the fire insurance map, provided most of what was needed, but in certain instances a number of supplementary sources had to be utilized as well. As Hall (1982, p.274) states:

> In historical geography ... there comes a time in most research --often before all the problems have been solved-- when no more data seems to be available. On some topics, there may apparently be little information of any kind; on others, the material may be incomplete, lacking in detail, or suitable only for qualitative analysis. The search for new primary sources, and the development of techniques for their analysis, should therefore be a constant preoccupation of the historical geographer.

Taking Hall's thought in a slightly different direction, information sources already known to be valuable in historical urban research are reviewed in this chapter in terms of their particular value for large-scale map production. This evaluation, developed in conjunction with the actual construction of the maps, provides a greater understanding of the sources themselves and of their potential use in this area of research. Similar evaluations of information sources used in historical urban research have been carried out by British geographers (Aspinall and Whitehand 1980; Aspinall 1982).

The primary sources listed below are those that were utilized in the construction of the maps of central Edmonton.

3.2 Fire Insurance Maps

3.2.1 Features of Value to the Research and Construction of Large-Scale Structural Base Maps

Large-scale map form. The greatest advantage of the fire insurance maps is their large-scale representation of structures, such as city buildings, roads and rail lines. All structures are represented to exact scale, allowing for the easy transfer of information in the development of a structural base map.

Comprehensive and Detailed Information Source. A great variety of information pertaining to the built environment, particularly the buildings, has been recorded on the fire insurance maps. All manner of building construction characteristics, such as building material, roof covering, window locations, wall thicknesses, building height, and so on, have been clearly represented for almost every building. Information to secure building identification such as street addresses, legal property descriptions and, in the case of larger buildings, the building name, have also been included. Building function has been recorded to such a high degree that varied uses within buildings have been noted by location.

Accuracy of Recorded Detail. Fire insurance maps are reputed to have been compiled and produced with the highest degree of accuracy, as demanded by their users, the fire insurance underwriters. Certainly, the Edmonton research disclosed no evidence of error. Although a comprehensive verification was not attempted, many alternative sources of information were consulted during the thesis research. Not once did it emerge that information taken from fire insurance maps for comparable dates was wrong.

Wide Spatial Coverage. A complete set of fire insurance maps for an urban community provides total coverage with the exception of outlying, sparsely settled areas.

Map Revision by Correction Slips. Before 1950, revisions were made to fire insurance maps by pasting correction slips on to map areas which had undergone physical or functional change. These piecemeal revisions provide a temporal record of the location of changes in the urban landscape.

3.2.2 Availability of Data Source

Variable. The present poor availability of the fire insurance maps is largely due to the policy of destroying old issues as they were returned to the manufacturer in exchange for updated sets. This practice has reduced the number of complete books to a few which chanced to escape destruction. Only one copy of Edmonton's first fire insurance map edition, that of 1907, is known to exist, while two complete copies of the 1913 edition, volume 1, the second to be produced, have been located. The 1907 edition is housed at the Alberta Provincial Archives, while copies of the 1913 edition can be found in the City of Edmonton Archives and in the Public Archives of Canada, National Map Collection, in Ottawa. The next surviving book of fire insurance maps is for 1953 and this can be found in the University of Alberta Map Collection. The 1913 edition held by the Public Archives of Canada is also available on microfiche at the University of Calgary Map Library. Little is known of the period between 1914 and 1953, such as the length of time that the 1913 maps continued to be revised, and when and if they were replaced with a new set of maps. The generally poor record for this period has been noted by Hayward (1977,p.xii), who found that the greatest gaps in the surviving Canadian map coverage occur between 1875 and 1890 and between 1915 and 1950.

3.2.3 Problems Encountered in the Use of the Data Source

Improper Placement of Correction Slips. In some cases, correction slips were applied in such a manner that they overlapped onto areas that were not to be covered, partly obscuring surrounding buildings. This was a minor problem, as it happened infrequently.

Incomplete Correction Slip Coverage. This applied exclusively to map elements that were not of prime importance to a fire insurance company. It was found, for example, that extensions to rail lines were not always recorded. They were included only when a building was updated and the rail line passed close enough to appear on the correction slip. As a consequence there can be areas on the fire insurance maps where rail spur lines appear to be discontinuous. However, complete rail line information was provided on newly-issued fire insurance maps, when the data base for the whole city was updated.

Misleading Representation of Street Network. The streets illustrated on the Edmonton fire insurance maps conformed to those shown by the city survey. This was misleading, however, since the streets existed only on paper. In actual fact some streets on the 1907 fire insurance maps were not graded and were still part of pasture lands. In this respect, these maps did not always depict the actual extent of the developed city environment.

Changes in Map Representation. Over the period between 1914 and 1953 changes were made in the scale of the fire insurance maps and also in many of the abbreviations used to denote building use. These changes were not major, although they can cause some confusion when research is undertaken using both sets of maps.

3.3 Henderson Directories

3.3.1 Features of Value to the Research and Construction of Large-Scale Structural Base Maps

Name Directory. The Henderson directories provide a detailed combined listing of businesses and individuals by alphabetical order of names. When the locations of individual businesses were known, it was then possible to match the business with the building presented on a fire insurance map of the same date. In many instances the fire insurance maps provided the particular use of a building, but did not provide the name or names of the businesses that occupied it. The matching of businesses and the buildings they occupied provided a means of gaining more information on the building itself, through the study of company histories and records. This added information simplifies the task of tracing an individual building through time.

Business Directory. The business directory which is incorporated in the Edmonton Henderson directories first appeared in 1908. Businesses were listed by name and separated into functional categories. Often a company's name would not be enough to reveal the nature of its business or the specific functions carried out at one or more of its city locations. These business directories therefore made it easier to determine the building use classification for individual buildings, when this information was not provided by the fire insurance maps, or when these maps were unavailable for reference.

Street Directory. One of the most valuable research tools for the construction of the structural base maps, especially when fire insurance maps were not available, was the street directory listing which the Edmonton Henderson directory began to offer in 1909. This provides an ordered listing by street number of all buildings having a street address, listing the building name, if it had one, and the tenants, whether commercial or residential. This listing proved extremely useful in the identification of individual buildings, especially over time, as it provided a means to trace them year by year.

Directory Advertisements. The advertisements for various city business scattered throughout the directory were in themselves a good information source, as they listed everything from the location of company offices to the product manufactured, sold or stored. In many cases a photograph of the building in which these businesses were located was also included. Often the information gleaned in this way was not quickly obtainable from other sources.

Major Building Directory. Later Henderson directories also included a separate listing of all major buildings by name, indicating their city address. This list proved valuable for a quick check of the continued existence of individual buildings from year to year. It had to be kept in mind, however, that buildings sometimes undergo name changes.

Temporal Coverage. Except for 1918, the Edmonton Henderson directories have been published annually since 1904. The continuity of this source is one of its greatest assets, as changes in Edmonton's building stock can be more readily identified when a comparison can be made from year to year.

3.3.2 Availability

Excellent. The City of Edmonton Archives possesses a complete set of Henderson directories.

3.3.3 Problems Encountered in the Use of the Data Source

Early Inconsistencies in Format and Content. In 1907 the Henderson directory for Edmonton provided only one mixed listing for all persons, businesses, government offices and organizations. Locational information, especially for local businesses, was in many cases vaguely expressed; e.g.

location on northeast corner of 1st Street and 2nd Avenue, rather than a specific street address. Incomplete street addresses were also a problem, particularly with reference to the distinction between locations on the eastern and western halves of Jasper Avenue. This distinction was important as Jasper Avenue was then numbered east and west from the present 101st Street. Taken in combination, these factors made the 1907 directory less useful than later editions.

The 1908 directory was greatly expanded over the 1907 edition, and included a separate business listing for the first time. Street addresses were more accurately recorded as well. Then, in 1909 the most important change occurred. This was the inclusion of the street directory, which became a standard feature of Henderson's Edmonton directories.

Mistakes in Printing. On occasion, mistakes were found in the ordering of buildings and their street numbering. These errors in printing are confusing, as an apparent change in building order can be taken to indicate the demolition of a building or the construction of a new one. Usually, however, it was possible to identify these mistakes with little difficulty.

Date of Issue. When a Henderson directory is used in association with fire insurance maps of the same year, the two sources are likely to represent different times. The contents of the Henderson directories were updated every May, while revisions were made to the fire insurance maps as they became necessary. As a result, the information presented by each source could be several months apart. A discrepancy of even a few months during a period of rapid structural and land use changes can result in substantial differences between the two sources. This problem was largely overcome by giving preference to the data from the fire insurance maps, as they contained the structural information that was needed for the production of the base maps. Only when information could not be obtained from the fire insurance maps would the Henderson directories be used as the data source.

3.4 Building Permits

3.4.1 Features of Value to the Research and Construction of Large-Scale Structural Base Maps

Information Provided on the Individual Building. Building permits provide information on the estimated cost, size (number of storeys), material of construction, builder, architect, and location (both the legal description and the street address) of the proposed building for which the permit was obtained. Also noted is the date on which the permit was filed and the name of the interest responsible for erecting the building. In total this information can be extremely useful in determining the exact location and identity of a building, as well as filling occasional gaps in the record of structural details.

Complete Listing. By city by-law whenever a new building was proposed for construction or alterations were proposed for existing buildings, a building permit was required to be issued before work could begin. This means that every building constructed or altered in Edmonton since the spring of 1905 has been a matter of public record.

Consistency in Recording. The information recorded upon the building permits has remained essentially the same since regulation began in 1905. This ensures that the basic information of value to large-scale map construction is available in a consistent form for the entire period of study.

3.4.2 Availability

Excellent. All building permits for the city of Edmonton dating back to the spring of 1905 are easily accessible in the City of Edmonton Archives.

3.4.3 Problems Encountered in the Use of the Data Source

Building Permits Not Acted Upon. Taking out a building permit does not necessarily mean that the building will be constructed, then or later. In fact a number of permits may be taken out at different times for various buildings for a single site. The problem here is to determine which building permit was eventually acted upon. This can be confusing as there may be a building in place that resembles the description of a building from a prior permit that was never acted upon.

Time Consuming. To locate the correct building permit can be a lengthy process as hundreds of permits are on file, from the smallest building alteration to the largest of new structures. Then, once a building permit is located for the correct property, it must be determined if that permit was acted upon, a procedure that can take a great deal of additional time.

Mistakes in the Records. Occasionally the wrong legal property descriptions have been recorded on the building permits, and the building that was eventually constructed will not appear at the location listed on the building permit record. This tended to be most common in the earliest records.

Estimated Cost. The cost listed for the construction of the building on the permit was an estimated cost, and the final cost was frequently much different.

Illegible Handwriting. Often, especially in the recording of early building permits, illegible handwriting has made the permits very difficult to read. This is particularly the case in the recording of names of the architects, contractors, and builders.

3.5 Photographs

3.5.1 Features of Value to the Research and Construction of Large-Scale Structural Base Maps

Dating of Buildings. In constructing a structural base map for a particular date, it is necessary to establish that the buildings to be mapped did actually exist at that time. Photographs are the best visual check, establishing with complete certainty the presence of buildings and establishing their structural form at particular dates.

Building Identification. Photographs taken at ground level can provide such information as building name, street number, and building function from signs posted on the front of the building. This information can be invaluable in obtaining a positive building identification, and can provide vital clues in matching written sources, such as the

Henderson directories, with graphic sources, such as the fire insurance maps. High-level photographs from building tops or aircraft (especially vertical air photographs) provide a visual means of confirming a building's ground-level layout. This can be matched with the layout determined from earlier or later fire insurance maps, to obtain positive building identification for dates when fire insurance maps are not available as the primary information source.

Building Layout and Location. Aerial photographs, both vertical and oblique, can provide visual information as to building size, physical layout, and placement on the building lot. This information is invaluable in representing buildings on a structural base map where comparable information cannot be obtained from a fire insurance map.

3.5.2 Availability

Good. Photographs of Edmonton buildings are available for the entire period of study, with excellent coverage for the years 1905-1914. High-level photographs from roof tops were also available for most of the years between 1905 and 1914, but the first photographs of Edmonton from aircraft date to the early 1930's. For this study of central Edmonton, the availability of quality photographs for the desired dates was excellent for most locations. The majority of the photographs examined came from the extensive collections at the Alberta Provincial Archives and the City of Edmonton Archives, while the remainder came from local publications, notably the Edmonton Bulletin and various publications of the City of Edmonton.

3.5.3 Problems Encountered in the Use of Data Source

Improper Dating and Identification. A major problem in using photographs, especially from the pre-1914 period, is the accuracy of the dates ascribed to them. This is particularly so for photographs not dated by the photographer. Some misdated photographs were discovered in the Provincial Archives, while numerous dating mistakes were found in present-day publications. Having the correct date of a photograph is essential, especially when it is used as a primary source of data about a continuously changing building stock. There were also instances when the wrong building name or address was ascribed to a photograph. These types of mistakes tend to be fairly infrequent and usually are less difficult to identify than a mistake in the date.

Chance Nature of Area Photographed. The researcher who uses photographs as an information source is totally dependent on what the photographer decided to record. Main streets or important buildings were photographed many times over, while side streets received little coverage. Frequently, the buildings of interest were photographed from a wrong perspective to be of use or at such a distance that they are unclear.

Quality of Photograph. Some old photographs are just not sharp enough to be used as information sources.

Air Photo Distortion. Depending on the angle and height from which a photograph from a plane is taken, there can be distortion of the size and shape of buildings. This can make building identification difficult and, more seriously, can hamper the reconstruction of a building's physical layout. When vertical air photographs are available this problem is largely overcome. Vertical photographs provide a much less distorted view of a building's physical layout.

3.6 City Newspapers

3.6.1 Features of Value to the Research and Construction of Large-Scale Structural Base Maps

New Growth Oriented. In the years before 1914 especially, Edmonton's major newspapers reported all aspects of city growth, but particularly its structural development. They reported on the building permits taken out, buildings under construction and buildings newly completed. A photograph of the completed building or a representative drawing were often included in the reports, as well as information on construction, building materials, contractors, architect and even tenants.

Current Information of the Day Accurately Dated. The early newspapers are a particularly valuable source of current building information. They give specific information for specific times.

3.6.2 Availability

Excellent. The newspaper availability for the period of study is excellent and coverage complete. Extensive files are available in the University of Alberta Library, the City of Edmonton Archives and the Provincial Archives. The Edmonton Bulletin was used almost exclusively for this purpose, since it provides wide coverage of the structural growth of Edmonton between 1907 and 1914.

3.6.3 Problems Encountered in the Use of the Data Sources

Inaccurate Reporting. Besides the obvious misprints, inaccuracies appeared regularly in the reports in the Edmonton Bulletin . Newspaper accounts had therefore to be used with caution, and their value as a primary information source for map construction was limited.

Very Current Information. Since newspaper coverage is immediate, and the details of a story can change from day to day, care has to be taken in following a news story through to its conclusion. For example, when a company announces its intentions of constructing a new building, the description may vary considerably from the building that eventually appears. Greater weight has to be given to reports of the finished or near-finished building than to the initial building plans.

Time Consuming.Although newspapers can be very rewarding sources, it can take a long time to locate useful information, especially if an exhaustive search is undertaken. For this study, only one newspaper, the Edmonton *Bulletin* was used extensively. To consult more than one newspaper can greatly increase the research time, with a reduced economy of effort. When one newspaper is concentrated upon,its format quickly becomes familiar and relevant articles are more readily located. Another time-saving step was to concentrate attention on the peak times of city construction, between late February and late October. Once an article of importance was located, it could then be checked for in other city newspapers.

3.7 Architectural Plans

3.7.1 Features of Value to the Research and Construction of Large-Scale Structural Base Maps

Structural Detail. Architectural plans provide a wealth of structural information for the buildings they represent. The scale drawings illustrate floor layouts, floor and wall construction, building materials, architectural details, and building elevations. These plans represent the most precise structural information source available on individual buildings. For large-scale base map construction, they are the most valuable source to turn to when structural information cannot be obtained from a fire insurance map.

Non-Structural Detail. Architectural plans also provide the names of building owners, architects and contractors, as well as indicating project cost, building location, and the date when the plans were produced. This information is very useful when more detailed research on a building is required.

3.7.2 Availability

Limited. Unfortunately very few architectural plans are available for early Edmonton buildings. A large set of architectural plans donated by the architectural firm of Bowey and Bowey, dating from 1910 to 1955, are on microfilm file at the Provincial Archives. Residential, institutional and commercial buildings are represented, but the few plans that relate to the study area between 1907 and 1914 were not required. The layout of these buildings was already known from either the 1911 or the 1914 fire insurance maps. Bowey and Bowey plans would be more useful for research on central Edmonton buildings between 1925 and 1950, since that period is better represented in the collection.

3.7.3 Problems Encountered in the Use of the Data Source

None. It is an advantage to know how to read architectural plans, but no great skill is required to extract information from them.

3.8 Land Title Certificates

3.8.1 Features of Value to the Research and Construction of Large-Scale Structural Base Maps

Property Information. Although certificates of title provide little information directly relating to buildings, they contain a variety of information pertaining to the property, which can make it simpler to search out data on buildings. The certificates list names of owners and where they reside, dates of land purchases, purchase prices and dates of land sales. Such information can aid in building identification if properly used. For example, changes in land ownership may foreshadow new building construction, which was particularly the case during Edmonton's boom period before 1914.

3.8.2 Availability

Excellent. Complete land title records for the city of Edmonton are held by the Province of Alberta, in the Land Titles Office.

3.8.3 Problems Encountered in the Use of the Data Source

Information Pertains to Land. When information on land ownership was examined, it was found that the registered owner did not always correspond with the person or persons erecting a building, at least directly. Land ownership and building ownership cannot be equated.

Cost. Since a search fee is levied for every title that is checked, the use of this source could be expensive if a large number of properties are traced.

4. CONSTRUCTION OF THE LARGE-SCALE STRUCTURAL BASE MAPS

4.1 Introduction

The primary objective of the thesis was to produce three large-scale structural base maps of central Edmonton for the years 1907, 1911 and 1914. The initial step was to establish an appropriate system of map construction which was well related to the characteristics of the primary data source, the fire insurance maps. With this system in place, it was possible to proceed to the development of research methods to determine the location and ground-level layout of buildings in central Edmonton.

4.2 Construction of a Primary Base Map

The three structural base maps to be produced fell within a span of eight years, 1907 to 1914 inclusive. Rather than draft a new structural base map for each of the three study years, it was considered preferable to produce one map which could then be adapted to serve as a base map for the other years. The year 1914 was selected for this primary base map, in part because complete structural information was available from a set of fire insurance maps. This permitted the base map to be constructed quickly and easily. More importantly, it provided the assurance of a structurally accurate base map, on which other maps would be built. Complete structural information was also available for 1911, again in the form of fire insurance maps. However, it seemed more logical to start in 1914 and work back sequentially to 1911 and 1907 than to start in the middle of the sequence of study years. The possibility of using 1907 for the primary base map was discounted, because the information sources for 1907 were known to be the most problematic of all three study years.

The advantage of this system of base map construction is that the primary base map provides a reference point which can be added to or subtracted from, to create a new structural base map for a desired year, depending upon the availability of alternative information sources. The procedure is also simplified when there is a short span of time between the date of the primary base map and that of the reconstruction.

An added benefit to the construction of a modified base map from a primary base map is that all structural changes between the two dates have to be identified, no matter how small. The system requires each individual building to be checked against the buildings on the primary base map. The researcher is therefore provided with a record of the extent and location of all the structural changes that occurred over the particular period of analysis. This allows all physical changes in the built environment to be traced easily.

At the same time, the primary base map system is not without its drawbacks. The main one is the time required to check every detail of the structural landscape, to determine variations from the primary base map. If there were extensive structural changes between the two years, it may be just as quick to construct a new structual base map, especially if complete fire insurance maps are available for both years. On the other hand by not carrying out the close inspection of each building that is required when a primary base map is used, otherwise undetectable changes in the structural environment may go unnoticed. It is possible, for example, for old buildings to be replaced by buildings of similar size and construction materials. If there is little difference in represented form between the two fire insurance maps, a substantial change in the built environment may be overlooked.

4.3 Construction of the 1914 Primary Structural Base Map and Establishment of the Map Scale

The construction of the 1914 primary structural base map was straightforward. It entailed the transfer, at true scale, of all structural features of the urban landscape within the designated study area, from the 1914 Edmonton fire insurance maps. In the process, the extremely large scale of the fire insurance maps(1:600) was reduced to give a map of more convenient working size (1:1200). This scale was still larger than was desired for the finished map, but it was adopted to facilitate the work of preparing the base map. It also ensured that there would be enough space to record information pertaining to the individual buildings.

Upon the completion of the 1914 primary structural base map, copies were printed to serve as a working map for the development of the structural base maps for 1911 and 1907.

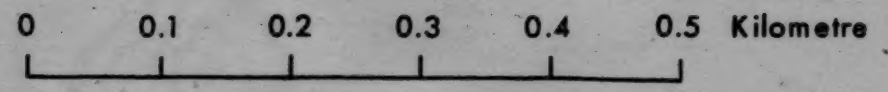
When the secondary base maps were completed, all three maps were reduced to 1:2400, redrafted, and then further reduced to the size displayed in the thesis 1:4114(Figure 4.1). A number of factors determined the selection of this final map scale. In the first place, to meet the objective of the thesis, it was necessary to adopt a scale that would clearly display the ground-level layout of the buildings within the study area, and leave them clearly distinguishable from adjacent buildings. The scale also needed to be sufficiently large to allow the structural base maps to be used to display information pertaining to individual buildings. If these criteria were not met, the intended objectives in producing large-scale maps would have been lost. In brief, the final map scale was established to retain the maximum structural detail while producing a map of a manageable size. The manageable size in this case was one which would allow the maps to be bound into the thesis with a minimum number of folds.

4.4 Construction of the 1911 Structural Base Map

The first step in modifying the primary base map, until it structurally resembled 1911(Figure 4.2), depended principally upon information obtained from a set of 1907 fire insurance maps revised to 1911. The process of adapting

Figure 4.1

Large-Scale Structural Base Map
of
Central Edmonton
1914 (August)



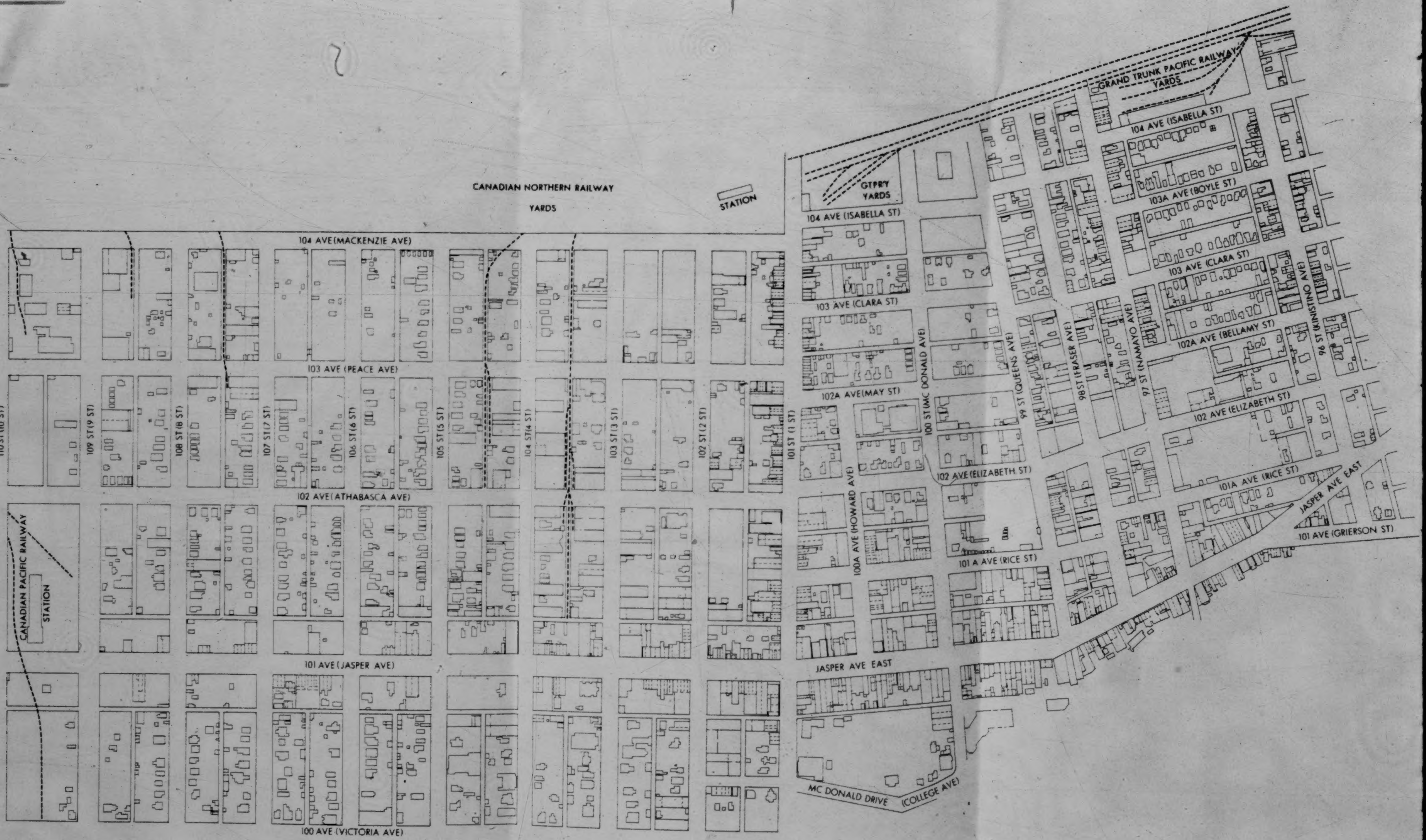
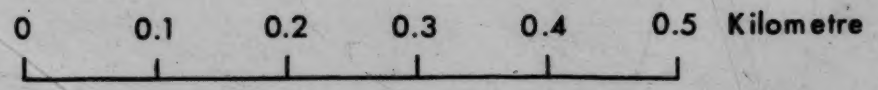
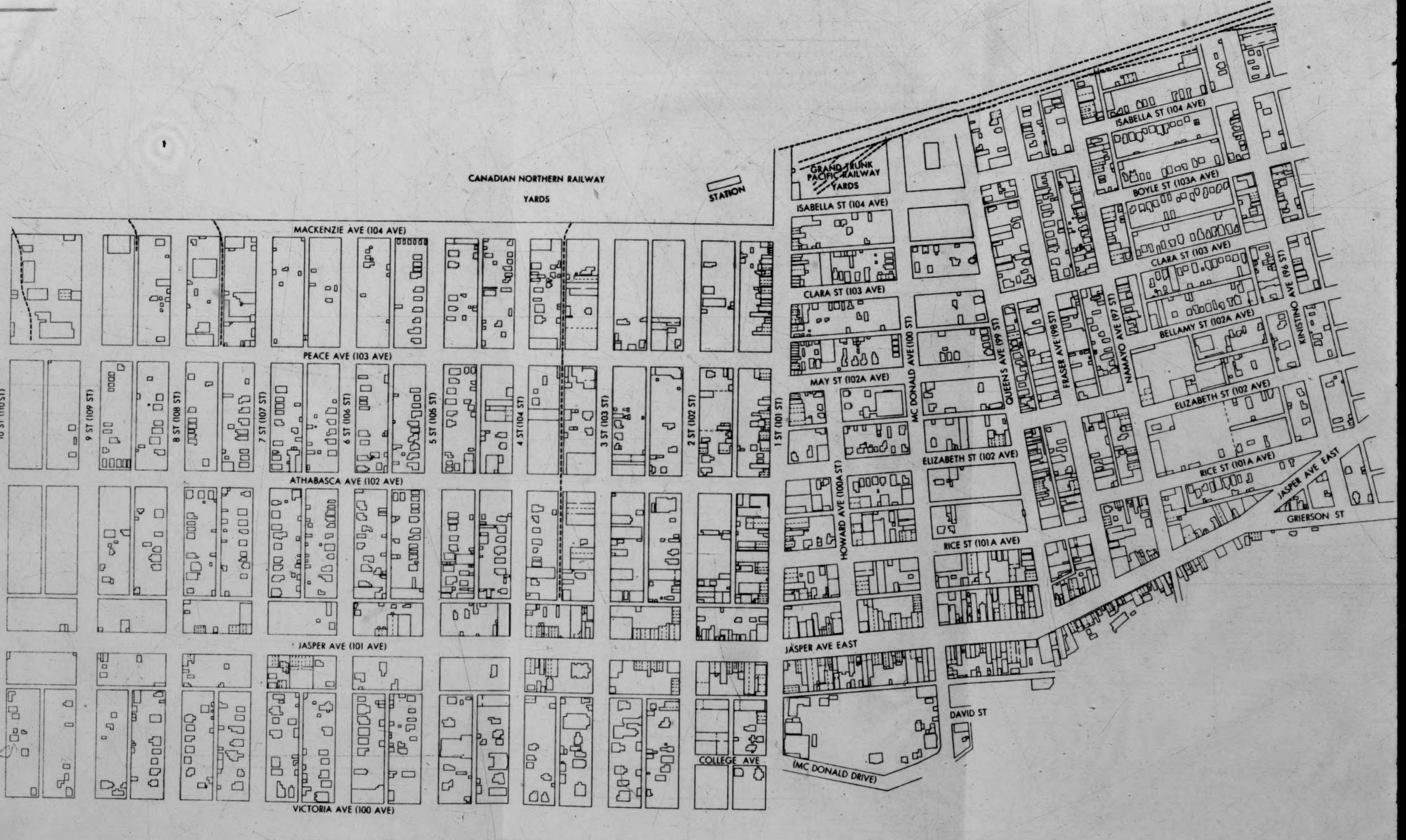

CANADIAN NORTHERN RAILWAY
YARDS
STATION
GRAND TRUNK PACIFIC RAILWAY
YARDS
GTPR'Y
YARDS
104 AVE (ISABELLA ST)
104 AVE (ISABELLA ST)
104 AVE (MACKENZIE AVE)
103A AVE (BOYLE ST)
103 AVE (CLARA ST)
103 AVE (CLARA ST)
103 AVE (PEACE AVE)
102A AVE (BELLAMY ST)
102A AVE (MAY ST)
102 AVE (ELIZABETH ST)
102 AVE (ELIZABETH ST)
102 AVE (ATHABASCA AVE)
101A AVE (RICE ST)
101 A AVE (RICE ST)
JASPER AVE EAST
JASPER AVE EAST
101 AVE (GRIERSON ST)
101 AVE (JASPER AVE)
100 AVE (VICTORIA AVE)
MC DONALD DRIVE
(COLLEGE AVE)
110 ST (10 ST)
109 ST (9 ST)
108 ST (8 ST)
107 ST (7 ST)
106 ST (6 ST)
105 ST (5 ST)
104 ST (4 ST)
103 ST (3 ST)
102 ST (2 ST)
101 ST (1 ST)
100A AVE (HOWARD AVE)
100 ST (MC DONALD AVE)
99 ST (QUEENS AVE)
98ST (FRASER AVE)
97 ST (NAMAYO AVE)
96 ST (KINISTINO AVE)
CANADIAN PACIFIC RAILWAY
STATION

Figure 4.2

Large-Scale Structural Base Map
of
Central Edmonton
1911 (December)




CANADIAN NORTHERN RAILWAY
YARDS
STATION
GRAND TRUNK PACIFIC RAILWAY YARDS
MACKENZIE AVE (104 AVE)
ISABELLA ST (104 AVE)
ISABELLA ST (104 AVE)
CLARA ST (103 AVE)
BOYLE ST (103A AVE)
CLARA ST (103 AVE)
PEACE AVE (103 AVE)
MAY ST (102A AVE)
BELLAMY ST (102A AVE)
ELIZABETH ST (102 AVE)
ELIZABETH ST (102 AVE)
KINISTINO AVE (96 ST)
NAMAYO AVE (97 ST)
FRASER AVE (98 ST)
QUEENS AVE (99 ST)
MC DONALD AVE (100 ST)
HOWARD AVE (100A ST)
1 ST (101 ST)
2 ST (102 ST)
3 ST (103 ST)
4 ST (104 ST)
5 ST (105 ST)
6 ST (106 ST)
7 ST (107 ST)
8 ST (108 ST)
9 ST (109 ST)
10 ST (110 ST)
ATHABASCA AVE (102 AVE)
RICE ST (101A AVE)
RICE ST (101A AVE)
JASPER AVE EAST
GRIERSON ST
JASPER AVE (101 AVE)
JASPER AVE EAST
DAVID ST
COLLEGE AVE
(MC DONALD DRIVE)
VICTORIA AVE (100 AVE)

experienced no structural change between 1907 and 1911. the 1914 map was an exercise in turning back time, removing structural additions that had been made over the previous three years and restoring buildings that had been demolished or altered. Buildings that appeared on the 1911 fire insurance map but not on the primary base map had to be added there, and buildings on the 1914 base map that did not exist in 1911 had to be deleted. In many cases this involved only partial removal, since many buildings were added to between 1911 and 1914. The majority of buildings within the study area were present in both 1911 and 1914, so no alteration was required to the base map.

The construction of the 1911 base map also brought attention to a major street realignment between 1911 and 1914. After 1911, Elizabeth Street (102nd Avenue) between Namayo Avenue (97th Street) and Queens Avenue (99th Street) was angled to the south, so the two segments of Elizabeth Street intersecting at Queens Avenue could be more closely aligned. The 1914 base map had therefore to be altered, to return the street pattern to its form in 1911.

The names of the streets and corresponding numbering of buildings also changed during this period. This in itself presented some problems when matching addresses to buildings, as it became more difficult to determine if a building on a particular site was the same one in both years. Special problems of identification arose when a building of a certain size and building materials replaced a similar building on the same site, and when buildings were altered between 1911 and 1914. In the latter case it was difficult to distinguish between enlarged buildings and totally new ones from the fire insurance maps. The other sources described in Chapter 4 had to be consulted, and extensive cross-checking was carried out to make a clear identification of the building in question. Although this information was not strictly necessary to the production of the structural base map, as the 1911 fire insurance maps provided the ground-level layouts of all buildings, it was important in determining where and when structural changes had occurred. This information was required for a map depicting structural changes over the period delimited by the base maps.

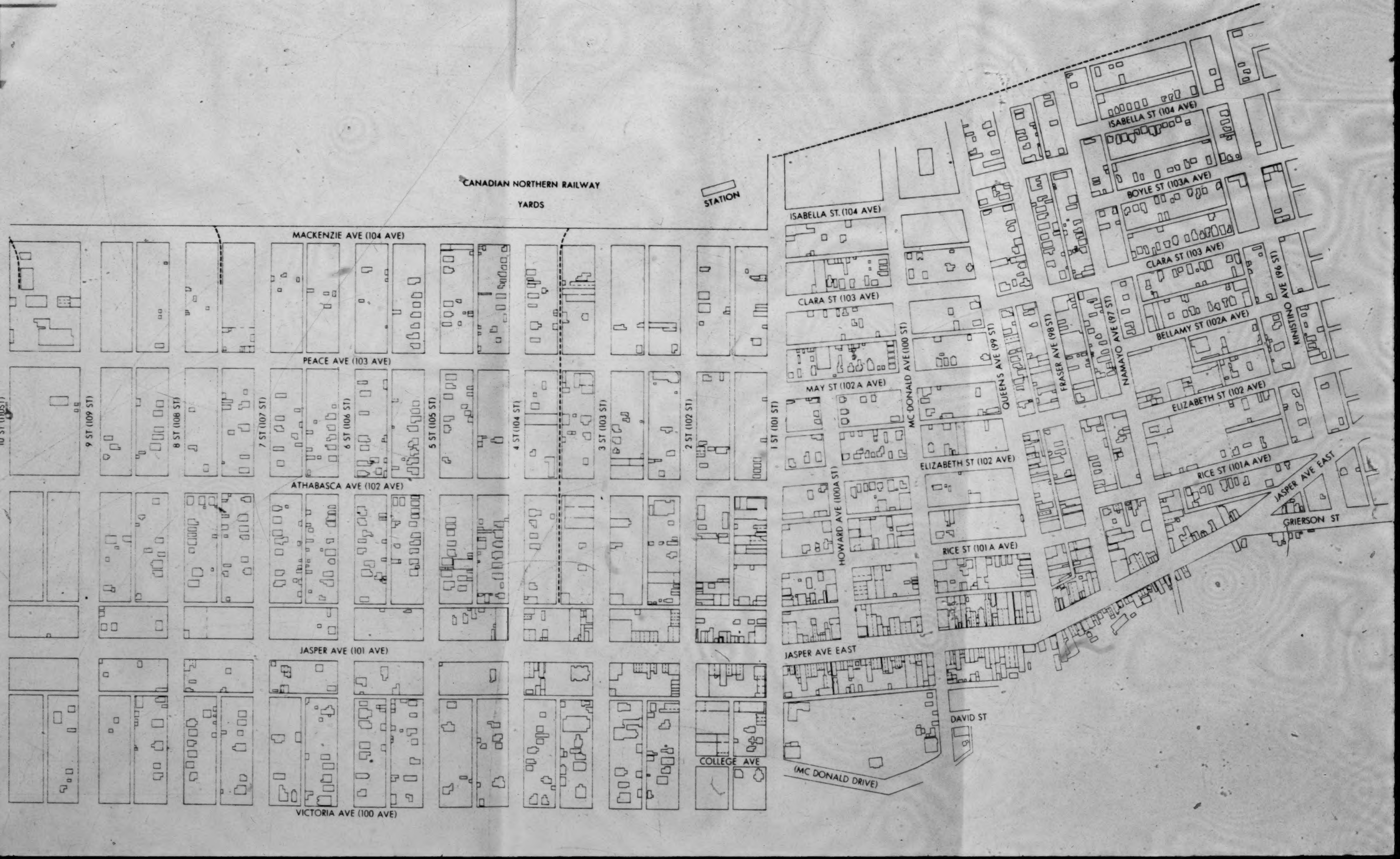
4.5 Construction of the 1907 Structural Base Map

The construction of the 1907 structural base map (Figure 4.3) was by no means as simple as that of 1911, and considerably more primary research was needed. A 1907 fire insurance book was available for Edmonton but it had been updated with numerous correction slips, ultimately representing the date of the last revision, 1911. Some structural information for 1907 could be taken directly from the fire insurance maps, but only for those sites that experienced no structural change between 1907 and 1911.

Figure 4.3

Large-Scale Structural Base Map
of
Central Edmonton
1907 (February)

0 0.1 0.2 0.3 0.4 0.5 Kilometre


CANADIAN NORTHERN RAILWAY
YARDS
STATION
MACKENZIE AVE (104 AVE)
PEACE AVE (103 AVE)
ATHABASCA AVE (102 AVE)
JASPER AVE (101 AVE)
VICTORIA AVE (100 AVE)
10 ST (110ST)
9 ST (109 ST)
8 ST (108 ST)
7 ST (107 ST)
6 ST (106 ST)
5 ST (105 ST)
4 ST (104 ST)
3 ST (103 ST)
2 ST (102 ST)
1 ST (101 ST)
COLLEGE AVE
(MC DONALD DRIVE)
JASPER AVE EAST
DAVID ST
ISABELLA ST. (104 AVE)
CLARA ST (103 AVE)
MAY ST (102 A AVE)
ELIZABETH ST (102 AVE)
RICE ST (101 A AVE)
HOWARD AVE (100A ST)
MC DONALD AVE (100 ST)
QUEENS AVE (99 ST)
FRASER AVE (98 ST)
NAMAYO AVE (97 ST)
KINISTINO AVE (96 ST)
ISABELLA ST (104 AVE)
BOYLE ST (103A AVE)
CLARA ST (103 AVE)
BELLAMY ST (102A AVE)
ELIZABETH ST (102 AVE)
RICE ST (101A AVE)
JASPER AVE EAST
GRIERSON ST

4.5.1 Methods for Extracting Original Information from Revised Fire Insurance Maps

Over a period of some months, with increased familiarity with the revised 1907 fire insurance maps, various techniques were developed for determining the locations and, in many cases, the ground-level layout of the building stock of 1907. To begin with, many sites on the fire insurance maps had only one correction slip covering them, and it was not difficult, when the map sheet was held up to a bright light, to see the original 1907 information beneath. As long as there were not too many correction slips pasted over one another, or matching one another on opposite sides of the page, since maps were printed back to back, the structures of 1907 could be seen even under multiple layers of correction slips, though this was more difficult.

It was also found, when the separate layers of paper correction slips were examined, that slips from each revision date were of slightly different colour. By matching a revision date to a particular shade of correction slip, it was possible to narrow down the times and locations of changes in building stock for particular properties. With this information it often became possible to back track through time, starting with the last known structure on the site, and checking Henderson directories for changes in the street directory, back to the year in which the change took place. Also, knowing the year of change and its approximate location, building permit records could be checked for that approximate time, to locate the building that occupied the property.

In most cases in which correction slips had been applied it was necessary to check an area larger than a single building lot to determine which building had undergone change. The slips usually cover an area greater than the actual site of the change, and in extreme cases a whole building might be duplicated. The fact that a building is depicted on a correction slip does not necessarily mean that there had been a structural change on the property. However, when many correction slips overlap one another and parts of them are exposed, it is often possible to determine which areas under the slips were revised during each revision. This can be accomplished by following the raised edge of the slip, which can be felt under the more recent correction slips, to outline the corrected area. Moreover, when a slip does not cover a building completely, it can be taken for granted that that building had not been included in that particular revision and can be dated in the form illustrated to an earlier time.

The best opportunity for determining what lies under layers of correction slips arises when they have been applied incorrectly, offset in relation to other lines on the map. When this happens, even when a number of correction slips are overlapped, offset lines depicting buildings can often be seen when the map sheet is held up to a light. When all correction slips are correctly aligned, it becomes very difficult, if not impossible, to make a judgement of which building in the revision area was actually being updated, and exactly when the updating might have taken place.

Another indication of a prior building under layers of correction slips is the building's street number, which is recorded on the fire insurance map on the edge of the street in front of the building it represents. When a building is demolished and replaced by a new building, the street number for the demolished building will not normally appear on the next revision of the map. Hence, if a street number can be seen under a few layers of correction slips, the location of a former building is indicated. The discovered street number can then be used, with the aid of a Henderson directory, to identify the former building at this address, and to determine the approximate date it was demolished. However, a building that survived no later than 1907 could be extremely difficult to identify, since the 1907 Henderson directory lacked a street directory.

In general, it was confusing to try to trace old buildings from street numbers obtained from fire insurance maps, especially during the period of rapid development between 1907 and 1911. As more buildings were added to city blocks, the street numbers of existing buildings were often changed to accommodate them. As well, the number of businesses occupying street front locations within a single building could vary from year to year. As each business had its own address, the number of street addresses asigned to each building varied accordingly. Over a period of several years it was difficult in some instances to trace a building back in time, utilizing the current addresses displayed on a revised fire insurance map. Still, in most cases it was possible to keep track of changing street numbers for individual buildings by cross-referencing different years of Henderson directories.

Instances also occurred when no street numbers were to be seen under layers of correction slips. This was taken to indicate that no buildings were present on this site for the years represented below the correction slip.

As expected, the area that received the most revision on the 1907 fire insurance maps corresponded with the area of highest building density, the commercial centre of the city, where the highest proportion of construction and demolition had taken place. This combination made it extremely difficult, if not impossible, to distinguish former buildings through the jumble of lines and layers of paper. As a consequence, data on the area of greatest change between 1907 and 1911 had to be obtained from a variety of other sources.

4.5.2 Construction of the 1907 Base Map When the Fire Insurance Maps Could Not Provide Total Structural Information

When it was no longer possible to extract information from the revised fire insurance maps, alternative sources were consulted to complete the 1907 structural base map. This demanded that a variety of sources be consulted, often simultaneously. That is, it was often necessary to consult several sources to pinpoint the site of a single building, its function, size, and so on, for the map date in question, February 1907. Except for the fire insurance maps, one source rarely provided all the information that was needed.

One supplemtary source that proved to be invaluable was a collection of city photographs from the early 1900's. Drawn largely from the Ernest Brown collection, these photographs provided an excellent visual record of the buildings of central Edmonton. However, their use as a data source was dependent on three main factors: their availability for the specific area under investigation, their quality and composition, and the date on which the photograph was taken.

The availability of photographs for specific streetscapes was the main limiting factor. Much of central Edmonton was photographed, but while some areas received a great deal of attention others were not photographed at all, or else the photographs have not survived. For example, comparatively few photographs of the outlying sections of the study area were found. Fortunately, these were also areas of low building density and they corresponded to sections on the 1907 fire insurance maps that had undergone little or no revision. Conversely, areas of higher building concentration, such as Jasper Avenue and 101 Street, experienced a higher degree of revision on the fire insurance maps but were also photographed more often. As a result, for much of the area where fire insurance maps could provide little or no information, photographs were available as a substitute data source.

The existence of photographs did not automatically mean they were of value in researching the ground-level layout of city buildings. Many of the photographs from around 1907 were taken at such oblique angles to buildings of interest in the thesis research that they were of little value. Most of these photographs were street shots aimed down the centre of the street and not towards any particular building. So, although many photographs of the buildings under study were available, few were actually useful.

Once an adequate photograph of a specific location was found, it was extremely important that it be properly dated. Most photographs used were dated by the photographer, though some problems arose using photographs which were dated improperly at a later time by another party. Improperly dated photographs were not common among the archival sources, but they caused great confusion wherever they were encountered.

When a photograph was suspected to be dated incorrectly, the first step was to examine photographs for the same area that were known to be dated correctly, to determine the new photograph's approximate date. A more exact date in a number of cases was determined by examining tenant's signs in building windows. With this information the Hendserson directories were consulted to establish the year in which the tenant occupied this particular building. Further clues were gained from the state of structural development present on the street. The presence or absence of certain buildings, or even building additions, narrowed down the possible date of the photograph.

The problem of accurate dating of photographs, in turn, is closely related to the problem of fixing the precise date that is to be depicted by a structural base map. During periods of rapid change, such as Edmonton was experiencing in 1907, the structural makeup of a city can be altered substantially in a matter of months. As nearly as possible, then, the base map should represent one particular month, to try to ensure that it has truly captured the state of the city at a definite time. Since the main data source for the structural base map of 1907 was a set of fire insurance maps depicting Edmonton as it stood in February of that year, the rest of the information illustrated on this map should represent, as closely as possible, February 1907.

The photographs used to aid in the construction of the 1907 structural base map varied from 1905 to 1909, a range that it was possible to turn to good advantage. As the photographs were used mainly to establish the presence and size of a building for February 1907, a building known to have existed at some later date could be traced back in time through photographs to see if any structural changes had occurred. For example, a building known to exist in 1911(the last year in which the 1907 fire insurance map was updated)is visible in a photograph from 1906. This fact establishes the building's presence in 1907, so it can be safely added to the 1907 base map. However, when tracing a building in this manner, it is important to note any structural changes which may have occurred between the time of the earliest photograph and the later ones, e.g. additional storeys or an expansion at ground level. If such structural changes had taken place, it was necessary to try to date then to ensure that the condition of the building in February 1907 was represented. Here, the building permit records were particularly helpful.

The research method described above tends to work best when it is possible to start with a building that is known to have existed at a later date (e.g. it is recorded on a 1911 fire insurance map), and then to move back in time to determine if the same building was present for the date under analysis. In the present case, if the building being traced back was built after 1907, the building it replaced had next to be traced back to 1907 or earlier to determine its identity. It is in this situation that photographs are of most value in providing clear building identification, by physically illustrating the building on the property in question. The visual record provided by the photographs can clearly demonstrate that a change has taken place on a specific building lot, that a building has been demolished and a new one erected in its place. Not every information source will clearly mark such a structural change. In the Henderson directories such a change may not even be detectable, if for example a building is demolished and quickly replaced by one of similar size on the same property. The new building would even be likely to have the same address as the old one.

City of Edmonton building permits also proved to be a valuable source in the construction of the 1907 structural base map, particularly in the structural information they provided about individual buildings. In addition, by consulting building permits for 1905 and 1906, the sites of buildings that might have been constructed just prior to 1907 were determined. This information was then checked to verify the existence of these buildings, first for the year in which they were constructed and then for 1907, bearing in mind that not all building permits were acted upon. Newspapers were checked for announcements of new buildings, for a period after the date of the issued building permit. Finding an article which reported the progress of the new building would confirm its existence. Henderson directories were also used, and provided the fastest means of verification, though there were a number of problems in using this source. One stems from the fact that not all buildings were listed in the directory, such as small workshops or warehouses, or buildings not having a street address because they were located at a rear of a lot. A further problem with the 1907 edition is that it does not contain a street directory. Instead, there is only a single listing in alphabetical order of all residents, companies, buildings, and so on. Consequently, the directory could not be used expeditiously to determine the sequence of buildings along Edmonton streets in 1907. To overcome this problem, a makeshift street directory was produced by ordering all non-single-family uses and buildings by street addresses.(Not all uses and buildings were given a street address in the directory, some were listed by general location.) The non-single-family uses were concentrated upon because they tended to be located in the areas that underwent the greatest structural change between 1907 and 1911, areas that were highly revised on the 1907 fire insurance maps. As a result little was known about them. The makeshift directory proved most useful in overcoming this deficiency. It served to establish the sequence of buildings in the study area, street by street, and so provided a basic identification which allowed more detailed information to be sought.

In working with Henderson directories, the procedure that was adopted was first to identify those buildings listed in the directory whose location and ground-level layout had already been firmly established for the structural base map of 1907. These buildings could then be used as reference points for determining the positions of nearby buildings and their uses(obtained from directory listings). Once the proper ordering and spacing of buildings and possible buildings was determined from the listed street addresses, research could begin on those individual buildings about which little was known, especially with respect to their ground-level layouts. It was here that the further sources (photographs, building permits and newspaper accounts) become critically important.

Even minor details in the 1907 dirctory could sometimes aid in producing the structural base map. For example, place of employment and place of residence were both listed. In many cases it was found that they were the same, probably indicating that the person lived above the place of work and so suggesting at least a two storey building.

An additional problem encounted in reconstructing the 1907 structural base map was the difference between the dates represented by the 1907 fire insurance map (February) and the Henderson directory(May). This difference, though small, was sometimes critical. In a number of cases it was found that the two sources disagreed over building use or even over the existence of a building. Since the fire insurance maps were the primary data source for the construction of the 1907 structural base map, their information was always given precedence over that from the Henderson directory. However, when information pertaining to particular buildings was not available from the fire insurance maps, it was necessary to turn to the alternative sources, which required a great deal of cross-checking. The fact that a building was recorded in the Henderson directory for May 1907 was not evidence that it was also there in February. Again, photographs, building permits and newspaper accounts all had to be consulted.

Finally, not all buildings could be placed on the 1907 base map with the assurance their their correct ground-level layout had been determined. There were occasions when only partial structural information could be obtained. For example, a building's location and street frontage might have been known, but not the distance that it extended back into the lot. In about a dozen cases, when there was no information on the ground-level layout of a building or its exact site, but the existence of the building was known, an approximation of the ground-level layout and its spacing with the surrounding buildings was made. The majority of these buildings were on 1st Street (101st Street) between Athabasca Avenue (102nd Avenue) and Mackenzie Avenue (104th Avenue). This area experienced rapid development after 1907, and almost all the previous buildings were replaced by 1911. From the Henderson directory it appears that the 1907 buildings were primarily residential, mixed with a small number of retail buildings and many vacant lots. The building locations were determined by their street addresses, which were worked forward in the following years of Henderson directories until they could be compared with the addresses of surrounding buildings whose exact physical location was known. The approximate sizes of the buildings were determined from buildings in the surrounding area which had the same use, taking into account the average building sizes of the day and their usual positioning on the building lots.

Further estimation of ground-level layout was made for a number of buildings on Namayo Avenue (97th Street) between Elizabeth Street (102nd Avenue) and Isabella Street (104th avenue). As well, some estimation of layout was made for buildings on Jasper Avenue, although that was much less of a problem because there were more photographs of area buildings. In all cases, every available source was consulted to best approximate the ground-level layout of these unknown buildings. The overall accuracy of this reconstruction cannot be known until the correction slips are removed from the 1907 fire insurance map. The structural base map of 1907 accurately represents at least 95 percent of the buildings of the spring of 1907.

5. DEMONSTRATED USES OF LARGE-SCALE STRUCTURAL BASE MAPS OF CENTRAL EDMONTON

5.1 Introduction

A major consideration behind the production of the large-scale structural base maps for this thesis was to be able to demonstrate their utility for conveying various types of information pertaining to the built environment of central Edmonton. In this chapter a series of maps depicting building uses and selected building characteristics for each of 1907, 1911 and 1914 is presented. In their own right, these maps constitute a new information source for historical urban research.

5.2 The Production of the Building Use Map

5.2.1 Sources of Information

The building uses of the entire study area were mapped for all three study years. The large scale of the base maps was found to allow building uses to be recorded with little compromise. Even the smallest buildings, or multiple ground-floor uses within a single building, were capable of being represented.

Of all the maps produced for this thesis the building use maps required the greatest effort. The uses of every building within the study area were determined for 1907, 1911 and 1914, in order to produce two maps for each year, one depicting ground floor uses (See Figures 5.1-5.3 in back pocket) the other, uses above ground floor(See Figures 5.4-5.6 in back pocket). This distinction was intended to permit a clearer presentation of building uses (since ground floor uses in business buildings commonly differ from those at the upper floors), as well as giving a more complete portrayal of the overall pattern of uses within the study area. Below-ground uses were not mapped, partly because they were not common and partly because they were not always recorded.

The base maps used to represent ground-floor layout were also used to represent above ground-floor use. The possible difference between ground-floor layout and above ground-floor layout required a structural knowledge of the individual building to properly depict the floor area of the building. This information was extracted from the fire insurance maps and photographs.

The major data sources were the fire insurance maps and the Henderson directories. As noted in Chapter 4, there is a discrepancy between the dates represented by these two sources, resulting in some informational inconsistencies. This posed few problems for 1911 and 1914, as building uses for those years could be obtained almost entirely from one source, the fire insurance maps. With respect to the 1907 map, however,the Henderson directory had to be consulted to fill the gaps left from the fire insurance maps. A comparison of building use information between the two sources, when both were available for the same location, did show differing building uses for the same buildings in a small number of cases. Inevitably the largest gaps in building use data on the 1907 fire insurance maps corresponded with those areas that underwent the greatest revision, in this case the commercial centre of the city. In effect, then, most of the building uses for the centre of the study area were determined from the Henderson directories, though some uses for 1907 could be seen under layers of correction slips. The building uses for areas of the 1907 fire insurance maps which underwent no revision, or one revision at most, were easily obtained from that source. The significance of possible changes in use between February and May was also reduced by the classification system employed on the building use maps. The majority of uses in the problematic area fell into two broad categories, commercial service and retail service, and changes in building use commonly occurred within a single use category.

In summary, the building uses represented on the 1907 base map were derived primarily from the fire insurance maps and secondarily from the Henderson directory, adjusted as far as possible to the February situation. Further confirmation of building uses was obtained from the large collection of photographs dating to 1906 and 1907, illustrating building uses which had remained unchanged from the previous year. To be on the safe side, however, the building use maps are said to depict Edmonton as it stood in the spring of 1907, rather than a particular month.

A second point of concern in the collection of building use data was the identification of above-ground uses. The fire insurance maps do not always provide information on upper-floor uses, especially in the case of small two-storey buildings that did not contain highly combustible materials. Many buildings in the study area fitted this description. In the research for the above-ground-floor building uses maps for all three years, Henderson directories were used to complete the record provided by the fire insurance maps. In the case of the 1907 map (Figure 5.4)the Henderson directory had to be relied upon extensively, but on the 1911 and 1914 maps (Figures 5.5 and 5.6) there were just a few instances where directory information was needed. It was found that the predominant use not listed for above ground-floor use in the fire insurance maps was rented lodgings.

5.2.2 Building Use Classification

The building use classification adopted for the thesis follows a system described in the Land Use Classification Manual produced by the Chicago Public Administration Service in 1962. Eleven use categories were selected, as depicted in the map legends.

Generally, it was an easy matter to fit building uses into the categories established by the manual, although it was sometimes difficult to determine which category was most appropriate. This was almost entirely due to the evolution of urban functions between the period before the First World War and 1962. Some uses that were characteristic of central Edmonton in 1907-1914 are not featured in the Chicago manual. With a little investigation, however, it was usually possible to find out enough about them to place them into a definite use category. Even so, a few building uses would not fit into a single category. A prime example was blacksmiths who provided a service to the public by shoeing their horses, while also filling a role as manufacturers in general metal work. In the building use maps constructed for this chapter, blacksmith shops are represented as a manufacturing/service use to denote their dual roles.

One change that might be advisable when producing building use maps in the future would be to eliminate the distinction made here between the categories of warehousing and wholesale warehousing. It is not easy determine which of these categories a company building fell into. It would be much simpler to combine the two, and to include buildings designated as storage as well.

The actual production of the building use maps entailed the preparation of a colour scheme to represent various building use categories. "Land use mapping involves differentiation among the various use types, and the most readable way to show this information is by color"(Public Administration Service 1962, p.10). The colours selected to represent the various building uses followed the guidelines set out by the Land Use Classification Manual.

5.3 Building Characteristics Maps

The second set of maps illustrated two building characteristics, building height(See Figures 5.7, 5.8, 5.9 in back pocket) and building material (See Figures 5.10, 5.11, 5.12 in back pocket), for each of the three large-scale structural base maps. These characteristics were chosen to demonstrate the versatility of the structural base maps in presenting varied types of information, as well as to show the amount of detail capable of being recorded, in a form that allows information on individual buildings to be easily retrieved. These maps also demonstrate the structural base map's value for the visual representation of information and for quickly determining spatial distributions and associations, while again retaining the ability to study the individual building. Lastly, these maps provide a view of the early development and growth of Edmonton, by depicting the changing nature of its built environment.

It was possible to construct these maps largely from the main information source, the fire insurance maps, which recorded building height in storeys and building material by a colour coding method. The production of maps for 1911 and 1914 was therefore straightforward, but additional research was required for the 1907 maps. Information on building height and material for a number of buildings was obtained from City of Edmonton building permits and from photographs.

In the construction of Figures 5.7, 5.8 and 5.9, depicting height, only buildings of three storeys or more were represented. This height was selected so as to illustrate buildings of most intensive use, clearly eliminating houses and smaller commercial buildings. The growth of Edmonton as a commercial centre between 1907 and 1914 is exhibited by the increasing number of tall buildings, as intensified commercial activity is usually associated with taller buildings. As well, this breakdown of building heights emphasises more clearly the changing physical character of Edmonton among the three years of study.

In the maps illustrating building materials (Figures 5.10, 5.11 and 5.12) two main categories of buildings are displayed: those of brick or concrete construction, and those of wood or metal-clad construction. This division was chosen to highlight the more solidly built buildings within the study area during a period when Edmonton experienced rapid growth. Also, these buildings of brick and or concrete would be more likely to have survived, representing part of our urban heritage today.

5.4 Building Demolitions Map

On the final illustrative map (See Figure 5.13 in back pocket) the structural base maps were used to depict buildings built in 1907 or earlier that were demolished by 1914. This map was created to illustrate how a number of structural base maps can be used in conjuction, to uncover structural changes in the built environment over time.

On a structural base map of 1907, two classes of buildings were depicted: those present in 1907 that had been demolished by 1911, and those present in both 1907 and 1911 but demolished by 1914. This was accomplished by a comparison of the three structural base maps of 1907, 1911 and 1914, isolating buildings present in 1907 but not on the base maps. A similar map was not produced for 1911-1914 as few buildings built after 1907 and present in 1911 were demolished by 1914. In general this type of mapping exercise has the potential to provide a wealth of information, as it provides a means to analyse everything from the durability of certain buildings to the direction of urban growth.

5.5 Summary

Figures 5.1-5.13 represent only a few of the potential ways in which the large-scale structural base maps of central Edmonton can be utilized. There are a wide range of subjects which can be visually displayed on these base maps, whether for a visual demonstration of spatial distributions or to analyze combinations of varied information. As well, once base maps have been prepared they can be increased or decreased in scale to suit a variety of research situations.

6. THE DEVELOPMENT OF POSSIBLE RESEARCH METHODS TO EXTEND THE CONSTRUCTION OF LARGE-SCALE STRUCTURAL BASE MAPS TO YEARS FOR WHICH FIRE INSURANCE MAPS DO NOT EXIST

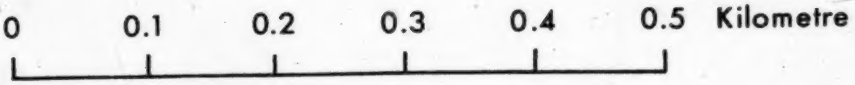
6.1 Introduction

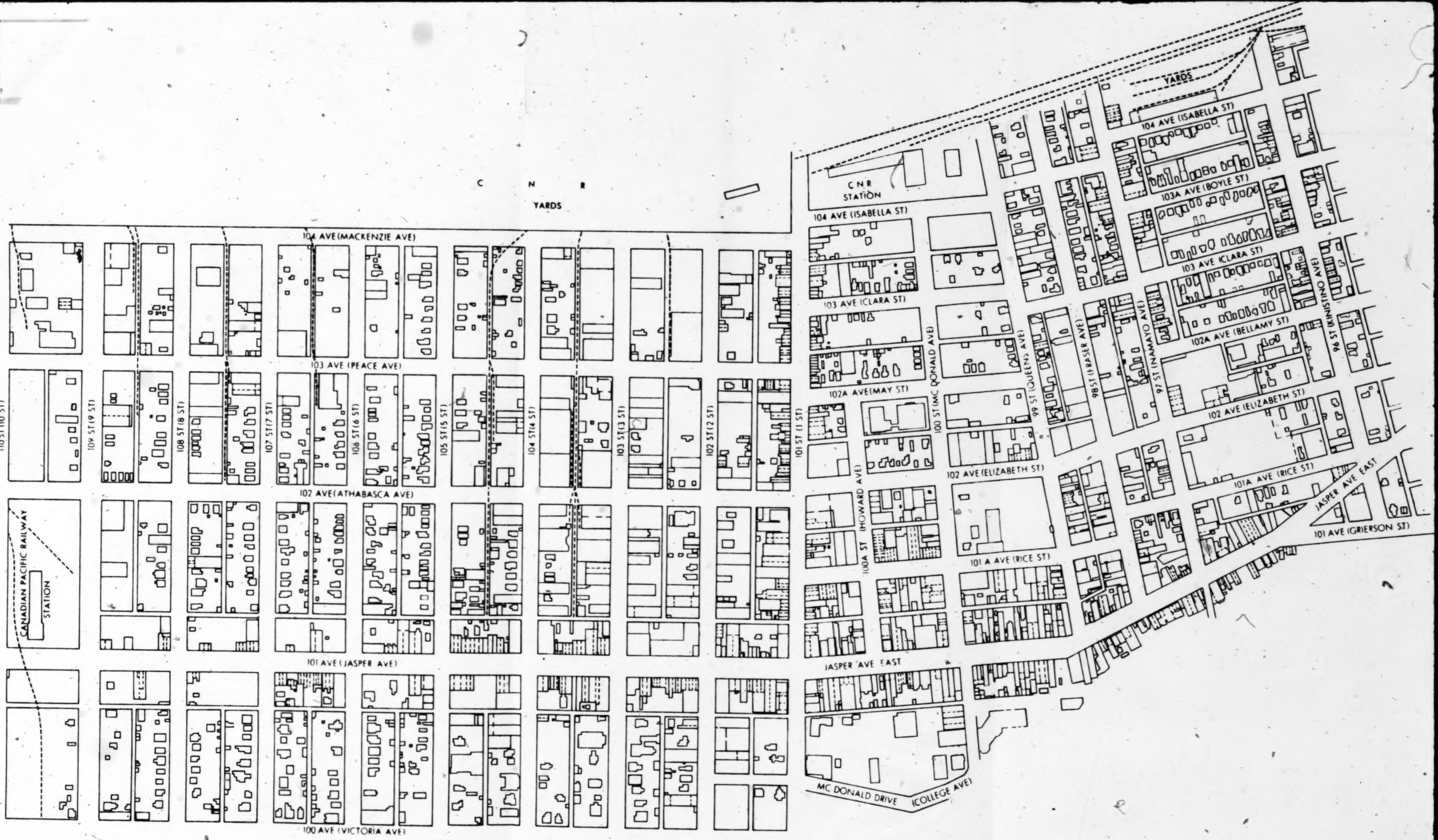
The large-scale structural base maps produced in this thesis were constructed in varying degree from information provided by the fire insurance maps. In general, however, the temporal coverage and the availability of the Edmonton fire insurance maps is poor, meaning that a limited number of years are represented by them. The research methods and procedures used to reconstruct the structural pattern of 1907 have therefore been extended in order to establish possible means of constructing large-scale base maps for years in which fire insurance maps do not exist at all. These techniques are outlined in this chapter. A base map of central Edmonton for 1929 (Figure 6.1) is also presented to illustrate the technique.

A period between two complete sets of fire insurance maps, 1914 and 1953, has been chosen for examination, as the bracketing of this period provides two structural reference points to work from. As well, a good variety of supplementary information sources is available for this period.

Figure 6.1

Large-Scale Structural Base Map
of
Central Edmonton
1929 (December)




C N R
YARDS
104 AVE (MACKENZIE AVE)
103 AVE (PEACE AVE)
102 AVE (ATHABASCA AVE)
101 AVE (JASPER AVE)
100 AVE (VICTORIA AVE)
110 ST (10 ST)
109 ST (9 ST)
108 ST (8 ST)
107 ST (7 ST)
106 ST (6 ST)
105 ST (5 ST)
104 ST (4 ST)
103 ST (3 ST)
102 ST (2 ST)
101 ST (1 ST)
CANADIAN PACIFIC RAILWAY
STATION
CNR STATION
104 AVE (ISABELLA ST)
103 AVE (CLARA ST)
102A AVE (MAY ST)
100 ST (MC DONALD AVE)
100A ST (HOWARD AVE)
102 AVE (ELIZABETH ST)
101 A AVE (RICE ST)
JASPER AVE EAST
MC DONALD DRIVE (COLLEGE AVE)
99 ST (QUEENS AVE)
98 ST (FRASER AVE)
97 ST (NAMAYO AVE)
96 ST (KINISTINO AVE)
YARDS
104 AVE (ISABELLA ST)
103A AVE (BOYLE ST)
103 AVE (CLARA ST)
102A AVE (BELLAMY ST)
102 AVE (ELIZABETH ST)
101A AVE (RICE ST)
JASPER AVE EAST
101 AVE (GRIERSON ST)

6.2 Techniques and Procedures for the Construction of Large-Scale Structural Base Maps for Years between Two Complete Sets of Fire Insurance Maps 1914-1953

The degree of difficulty to be experienced in the research and production of large-scale structural base maps will vary greatly for the individual years between 1914 and 1953. As a general rule, the closer in time to one of the available fire insurance maps, the easier it will be to produce a structural base map. This is subject however to the rate of structural change within the study area, and to the availability of supplementary research sources for the years under study. It is also desirable to set a sequence of steps of map construction to speed up production, reduce the duplication of research, and ensure a greater accuracy of the final product.

The first step involved in constructing a structural base map is the establishment of the street pattern. This information is obtained, in the first instance, from the fire insurance maps closest to the year for which the structural base map is being produced. Next, any changes which might have occurred between these two dates must be identified. These changes could include new street alignments, and street openings or closures. This information can be obtained from street maps or government topographic maps for the year under study or close to it. Such changes can be verified by checking the street directory in the Henderson directory.

The second step is to determine which buildings are present on both sets of fire insurance maps bracketing the year of the map being constructed. This automatically establishes that these buildings existed in all years during the intervening period, so they can be safely depicted on the base map for the year under construction. These identifiable buildings now become reference points, around which the constantly changing urban landscape can be reconstructed. With these points known it is easier to establish the identity of the surrounding buildings, which may have undergone name and street address changes as well as additions and removals. However, as pointed out in Chapter 4.2, caution must be exercised in concluding that certain buildings were actually present for the entire intervening period. All must be checked to ensure that the same buildings have indeed been recorded on both sets of fire insurance maps, and not buildings of similar size and building material, which have replaced the original structure on the same site at some intermediate time. Thus every building should be investigated from various sources, such as Henderson directories (the disappearance of a building for a year could mean its demolition and the construction of a new building on the same site), photographs (though facade alterations can change the appearance of the building, so that an old building may seem to be a new one) and building permits (to determine that no new permit was issued for the site).

When the building is clearly identified possible physical changes, such as the addition of floors, building extensions and so forth, should be noted. If the building was altered between the first fire insurance map and the second, it is necessary to secure the date of the change or changes, to find out which building form is correct for purposes of base map construction, the altered one or the unaltered. The best source for this information is the city building permits, as all building renovations and additions are recorded. Still, the check must be thorough, as not all building permits taken out are acted upon. Multiple permits can be taken out for the same building, with any number of them or none of them being acted upon. At this point it is useful to make a list of all building permits taken out for the area of study for the intervening period, providing a quick reference sheet for faster building identification, and subsequent map construction.

The identification of a building found on both fire insurance maps provides an almost instant physical layout for structural base map construction, but a building that appears on only one of the sets of fire insurance maps requires much more investigation to secure its identification at a specific location for a particular time. There are three possible scenarios. First, the building on the first fire insurance map will still be present in the year being researched, but was demolished at some later date before the last fire insurance map; second the building on the first fire insurance map has been demolished by the date under investigation and has been replaced by the building found on the last fire insurance map; and third, the building that existed in the year for which the base map is being constructed was not the same as the building depicted on either of the insurance maps. This is, the original building was replaced by another which, in its turn, was replaced by a third.

First it is necessary to determine which of the above scenarios applies, as each requires somewhat different research to be undertaken. The first steps are the same however, starting with the building on the earlier fire insurance map, and working forward from then to the year for which the base map is being produced. The critical concerns are, first, to determine exactly when the original building was demolished and, second, to determine exactly when the replacement building was erected. The quickest way to check for the removal of a building is to consult the Henderson directory, although, as described in Chapter 3.3.3, there are several difficulties in identification using this source. When attempting to trace a building forward, many things can have changed to confuse its identification. With changes in street numbering the building may gain or lose numbers ascribed to it in the street directory. Over a period of years the same building will have a variety of street numbers. The subdivision of ground floor space, for example will result in an increase in street numbers pertaining to the structure, as well as an increase in ground floor uses. In a directory this resembles the addition of a new building to the block. The reverse process can also occur, one ground floor use replacing a number of different ones. This causes street numbers to disappear from the directory, as also happens when a building is demolished. This is one of the most difficult problems to deal with, especially when it affects smaller buildings which tend not to be identified by building name in the directory. Changing building uses in surrounding buildings can add to this problem,as identifiable points of reference change. This is where already identified buildings provide that all-important reference point to work from. A final check can be made from the building permits, to see if any permits were taken out for the property under review during the period in question. This will also be an opportunity to check for any alterations that may have changed the physical form of the buildings. If, as the outcome of these checks, it is determined that the building shown on the first fire insurance map is was still present at the date for which the base map is being constructed, the structural information can simply be transferred, making provision for any alteration in the interim.

In the second scenario, when the building that is encountered on the earlier fire insurance map is known to have been demolished and replaced by another building before the date for which the base maps is being constructed, it is a matter of checking the new building to see if it is the one illustrated on the later fire insurance map. The sources, once again, are chiefly the Henderson directories and building permits. Once the new building is known to have been present in the year that is being mapped, it is just a matter of continuing to work forward in the street directories from the bulding's construction date until the date of the later fire insurance maps, to be sure that the same building has been depicted. When this is confirmed, the building's ground-level layout can be obtained from the fire insurance map for that site.

It should also be noted, depending on the year for which a structural base map is being produced, that it may be easier to work back from the last fire insurance maps than forward from the first. This is especially the case when the year being investigated is much closer to the year of the later fire insurance map than to the earlier one.

The final scenario, dealing with the most difficult type of building to identify, and hence the most difficult map to reconstruct, occurs when the building on the earlier fire insurance map has been replaced by another building before the year of the base map, only to be demolished in its turn by the time of printing the later fire insurance map. No structural record of this building can be secured from either of the fire insurance maps.

Once it has been established, by reference to Henderson directories, that a building existed on the site for the year under construction, and it has been determined that it is not the same building that appeared on the most recent fire insurance map for that location, the Henderson directories can normally be used to pinpoint the year of construction. Working back, year by year, through the street directory from the year the building under investigation is present, there will eventually be a change in the listings for the property in question. The demolition of a building could be marked in the directory by a year when no address is given for its location in the street, meaning that the site was vacant or that a building might have been under construction. As well, when a change in street numbering is encountered but the street numbers of adjoining buildings have remained the same, it could mean a new and larger building has replaced the original one on this site. Having narrowed down an approximate year of change in this way, building permit records can be scrutinized for the immediate time period. If the information on the suspected new building in the street directory then corresponds with the building permit, this permit will provide further details that will be useful in determining the building's ground-level layout for the base map. Such items as building material, number of storeys, exact location, ownership and architect, all open avenues for further research. For example, knowing the name of the architect may lead to the building plans being found. As well, having the exact date for which the building permit was issued may lead to the discovery of a corresponding annoucement in the newspapers, providing more detail and possibly a drawing of the proposed building. Being able to identify the building or its major tenant(s) could lead to the discovery of company journals or histories for further details. Even if these supplementary sources are not available, the building permit should provide enough information, together with the knowledge of the surrounding buildings, to allow the building to be identified from a photograph.

Street-level photographs provide useful exterior views of buildings being investigated, but high-level photographs are really required if the layout of the building is to be determined. Such photographs are available for Edmonton for the period between 1914 and 1953 , but their coverage is irregular. There are number of good rooftop panoramic views that are particularly valuable because Edmonton was small enough, at least until the 1920's, for a large part of the city centre to be seen from a single photograph location. Aerial photographs, both vertical and oblique, which became available after 1930 for central Edmonton, are of still more value, especially as rooftop views tended to diminish in value with the increasing concentration of buildings of generally the same height in Edmonton's core. The aerial photographs taken from a higher altitude provide greater coverage of the central portion of the city, so becoming a very useful tool in the identification of buildings and the determination of their ground-level layout. If photographs, either from aircraft or building roofs, are not available for the exact date needed for a structural base map, photographs from the closest available years to this date could be utilized. There is a good possiblity that the buildings in question would be present.

Although photographs play an important role as an aid to determining the ground-level layout of a building, it is more important that they provide visual verification of a building's existence. This is crucial when investigating buildings that are not recorded on any fire insurance maps, as supplemenntary sources such as buildings permits or Henderson directories cannot provide visual verification of the building.

In most cases the physical ground-level layout of buildings within the central area of Edmonton can be determined for the period 1914 through 1953. In the few exceptions, it should be possible to draw a close approximation of the building's layout from a combination of alternative information sources. In some instances, where the exact ground-level layout of a building is not known, it is even possible to deduce its approximate layout on the basis of its use, since building form is sometimes dictated by use (for example, gas stations).

6.3 Conclusion

Through the research methods developed in this chapter it would be possible to construct large-scale structural base maps for years other than those for which fire insurance maps exist. With more base maps available, their potential value in urban research could also be greatly expanded. The production of maps for these additional years, however, must be tempered by the fact that the value of structural base maps rests in their detailed structural representation of the built environment. If their accuracy decreases so will their value as an information source.

7. CONCLUSION

7.1 The Practicability of Constructing Large-Scale Structural Base Maps for Previous Time Periods

This thesis has demonstrated, through the compilation of maps of central Edmonton for 1914, 1911 and particularly 1907, that it is possible to construct large-scale structural base maps for past years through the research methods developed in Chapter 4. The ability to produce such maps for any selected year, however, is governed ultimately by the availability of accurate information sources, capable of providing the required temporal and topical coverage, singularly or in combination, for the study period and study area. The availability of such information is itself dependent upon knowing the sources that are most likely to be useful, and being able to extract the required information from them. Taking this into account, the practicability of constructing base maps of Edmonton for the central study area, for other time periods, was examined.

7.1.1 Edmonton pre-1907

The construction of pre-1907 base maps is complicated by the lack of fire insurance maps, meaning that other information sources would have to be relied on entirely. However, these sources become progressively more variable in terms of content and temporal and spatial coverage, for years prior to 1907. Detailed building permit records are available only from the spring of 1905, while the first comprehensive Henderson directory dates to 1907. Generally a good photographic record is available from 1905 to 1907, but it too is more variable for earlier years. Newspaper availability remains excellent, though the value of newspapers for determining building location is diminished by the limited reference to buildings by street address. In general, the ability to trace a building back through time is greatly lessened before 1907. As this is an essential part of map reconstruction, the ability to produce an accurate structural base map is decreased. Even when buildings could be traced, with their locations known, information on the size and configuration of the buildings likely would not be available. Considering the problems that were encountered in the construction of the 1907 base map, when partial fire insurance map coverage was available, the problems encountered in the construction of structural base maps for any earlier year are bound to be greatly increased, even with the 1907 base map to work from as the reference point.

7.1.2 Edmonton 1914 to Present

There was almost no structural change within the study area between the years 1914 and 1919. As a consequence, large-scale structural base maps for this period could be easily constructed with the aid of the 1913 fire insurance maps. Construction activity increased in the study area between 1920 and 1926. However, this entailed the addition of a small number of buildings that could be quite easily located, and then incorporated onto the 1914 base map. The availability of supplementary information sources is very good for this period.

New construction greatly increased during the period of 1926 to 1930, peaking in 1929. The buildings constructed in central Edmonton during this period tended to be larger than those from previous periods. As a result, it is generally easier to locate these buildings and to determine their ground-level layouts. The commercial core of Edmonton remained relatively unchanged from 1914, with the majority of the new buildings being located on its periphery. As a larger number of buildings were added and demolished during this period than in previous periods, more research would be required in the construction of base maps. Again, the availability of supplementary sources is good.

Between the years 1931 and 1937 almost no new construction occurred within the central Edmonton study area, meaning that a base map constructed for 1931 could easily be used for 1937 with only minor alterations. Construction slowly increased once more from 1938 to 1947, but again there were relatively few changes to the study area's building stock. This period, however, would probably be more difficult to reconstruct than previous periods simply because it is more than 30 years beyond the date of the 1914 fire insurance maps. The next available fire insurance maps represented 1953, but because of a new surge of construction in the late 1940's and early 1950's, the study area was significantly altered. On the other hand, the photographic record of the study area was improving at this time.

The construction of large-scale structural base maps from the late 1940's to the mid 1960's should not be difficult, as fire insurance maps were available for 1953, 1959, and partially for 1964 and 1966. As a whole the construction of large-scale structural base maps of central Edmonton would be clearly possible from 1907 to 1966. The construction of large-scale base maps from 1966 to the present would also be possible, because of the increasing number of supplementary sources which might be consulted.

7.1.3 The Time Required to Produce Large-scale Structural Base Maps

A major consideration in the construction of large-scale structural base maps is the time required to compile and display structural information in this form. This thesis has demonstrated that it is possible to produce such maps, though it was found that the initial stages of map construction were time-consuming.

The first working base map produced for this thesis, that of 1914, required 3 and one half weeks to construct. Although total structural information was available from the 1914 fire insurance maps, the large scale of the map

(1:1200) being produced, combined with the large size of the study area, resulted in a lengthy period of construction. In constrast, the 1911 base map was produced in one week by working from the completed 1914 base map and altering it to reflect 1911. The speed with which the 1911 map was constructed was due in large part to the availability of complete structural information on the 1911 fire insurance maps. The 1907 base map was also constructed by altering the 1914 base map, but it required 6 weeks to complete, as a large variety of supplementary information sources needed to be consulted.

Once an initial base map is prepared, it is a much easier matter to construct base maps for additional years. This was borne out during the research for this thesis, when it proved possible to construct the 1929 base map in a period of one and one half weeks. As more structural base maps are produced for a number of years, the time required to produce maps for intervening years is correspondingly reduced, as there are a greater number of reference points to aid in map construction.

7.2 Storage and Use of Thesis

All manuscript maps prepared during the production of the 4 large-scale structural base maps will be housed in the the University of Alberta Map Library. This collection comprises the working base map(1:1200) for 1914, 1911 and 1907; ink drawings(1:2400) for 1914, 1911 and 1907; and ink prints(1:4114) for 1914, 1911, 1907 and 1929, from which the maps bound into the thesis were reproduced. All these maps are available for duplication, although the ink drawings at 1:2400 would be the most valuable for other users. They can easily be increased or decreased in scale, or reproduced in any manner to suite the user's needs. The large-scale maps could also be digitized for computer storage, thus opening up a variety of ways to analyse and display information pertaining to city buildings.

7.3 Possible Benefits of Large-Scale Structural Base Maps to Historical Urban Research

Large-scale structural base maps can be of value to historical urban research, first as an historic information source, and second as a research tool. They are an information source in their own right, as they illustrate such items as building size, their spatial arrangement in relation to other buildings, and actual building layout. As well, the maps can be used to store and display additional information at the level of the individual building. These structural base maps thus become a meduim through which information obtained in various forms from diverse sources can be combined and illustrated.

As a research tool, the ability to construct the large-scale structural maps would be a very useful aid to time-related studies of the changing structural landscape. As temporal coverage of the structural record of the urban landscape is poor for most North American cities, study in this area has tended to be limited. Conzen (Whitehand 1981,p.16) emphasised that:

> Period typologies must be grounded in time spans that have a degree of unity within the course of social and economic history: those based on arithmetic divisions or reflecting only the availability of source materials are liable to obscure rather than aid explanation.

In other words, the capability of producing base maps for years that truly relate to significant trends of the past is a vital aid to scholarly interpretation.

Large-scale base maps can also be of value to government agencies concerned with the preservation of our building heritage or plannning with heritage in mind. Not only can buildings of significance to the community be identified from the large-scale maps, but they can also be used to trace the history of such buildings, by recreating the physical setting in which they were originally situated and then tracing it forward. By researching individual buildings or groups of buildings in this manner, the processes which have shaped our present urban landscape can be better understood. Conzen (Whitehand 1981,p.13) stressed the value of the evolutionary approach:

> The retrogressive method of working back from present-day forms is rejected quite simply because a proper understanding of processes cannot be attained from the analysis of relics, even in the case of town plan, which produces a more complete collection of residual features than the building fabric or the land use pattern: those parts of the townscape that have been removed are as important to a theory of townscape development as those that have survived.

It is in this area of research that large-scale structural base maps could find their greatest value.

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APPENDIX

Omission of Rail Spur Lines on the 1914 Base Map

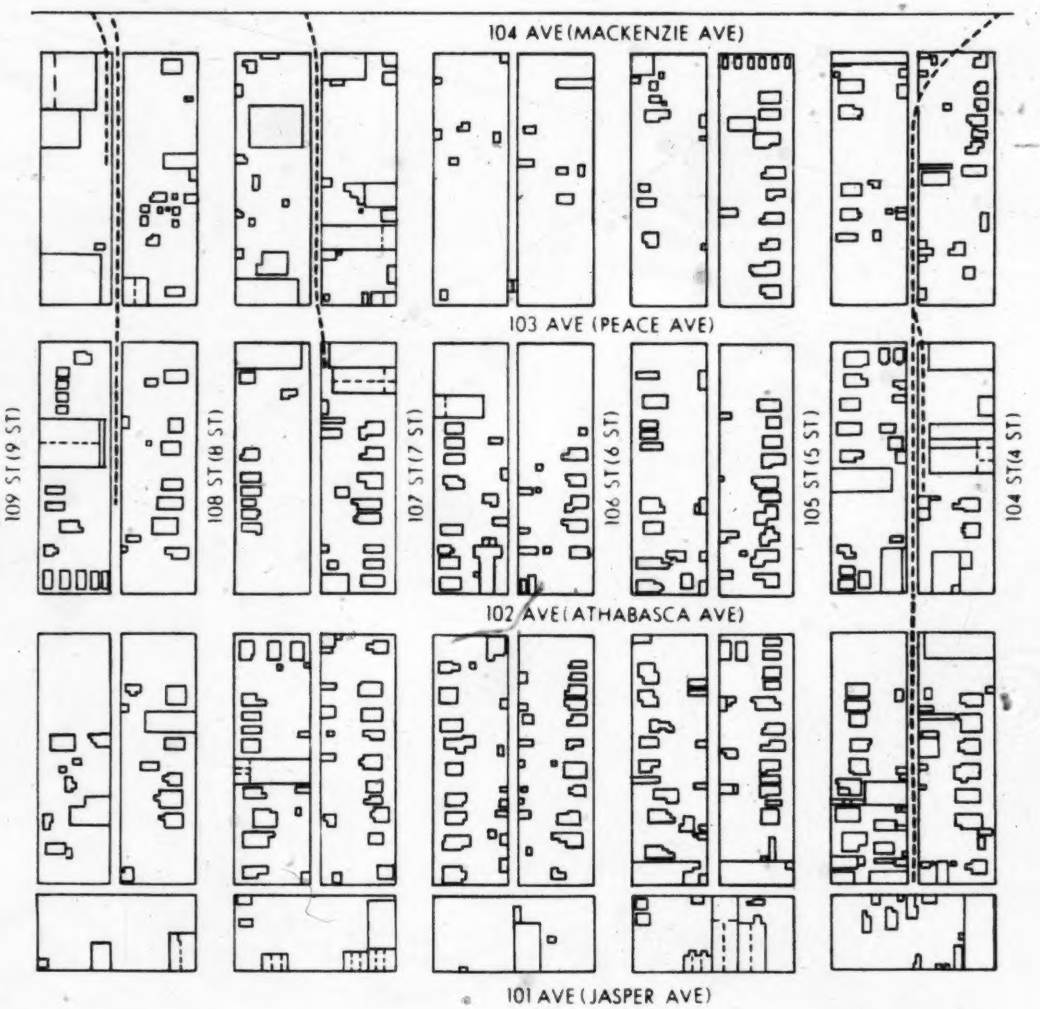


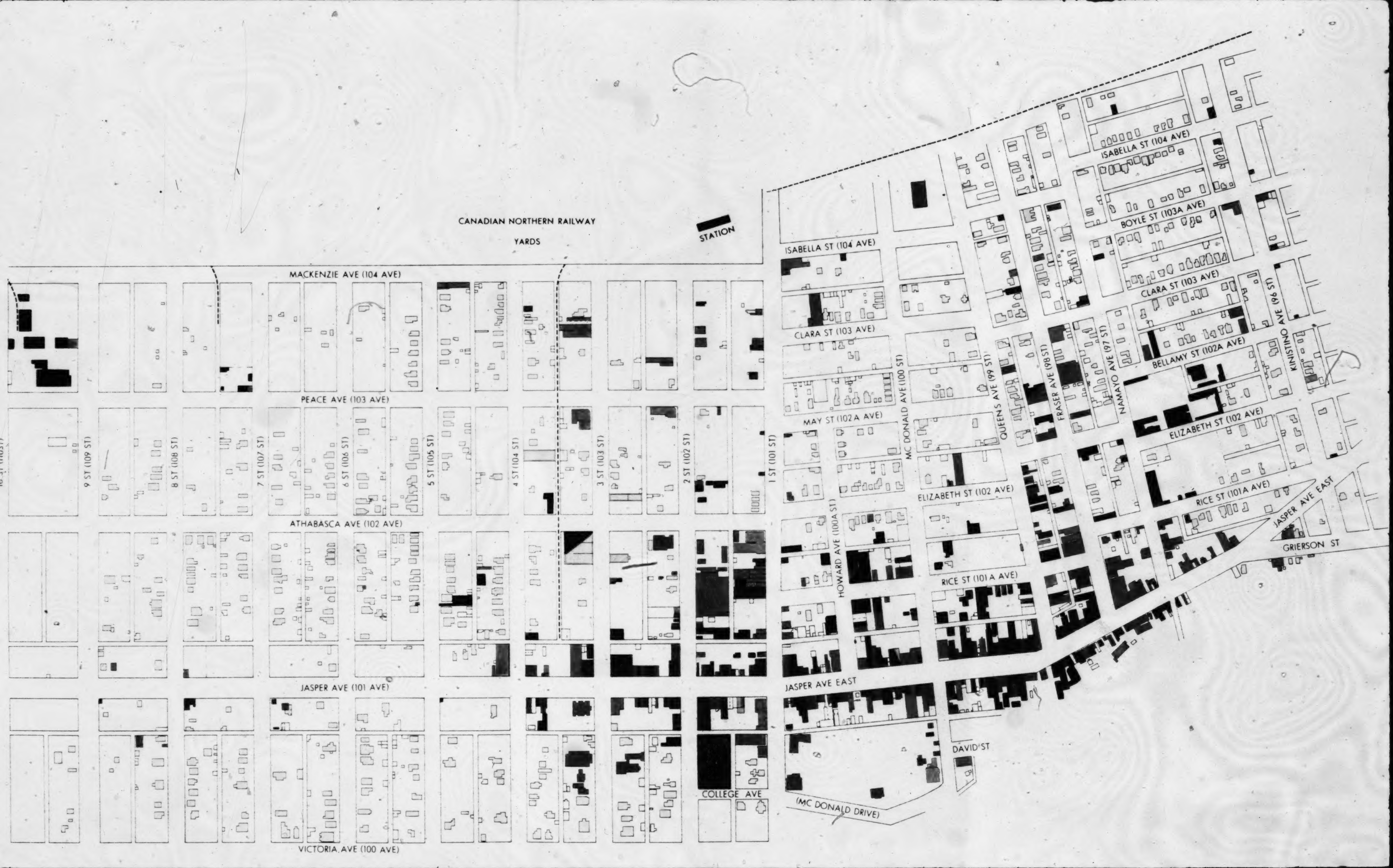
Figure 5.1

Ground - Floor Use

1907 (Spring)

BUILDING USES

- ■ Commercial Service
- ■ Retail Service
- □ Private Residence
- ░ Apartment
- ▨ Boarding House and Hotel
- ■ Institution (Public and Semi Public)
- □ Wholesale Warehousing
- ■ Warehousing, Storage, Transportation and Utilities
- ▨ Industry Non Manufacturing
- ■ Manufacturing
- ▒ Clubs and Halls
- □ Vacant or Under Construction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YARDS
STATION
MACKENZIE AVE (104 AVE)
PEACE AVE (103 AVE)
ATHABASCA AVE (102 AVE)
JASPER AVE (101 AVE)
VICTORIA AVE (100 AVE)
9 ST (109 ST)
8 ST (108 ST)
7 ST (107 ST)
6 ST (106 ST)
5 ST (105 ST)
4 ST (104 ST)
3 ST (103 ST)
2 ST (102 ST)
1 ST (101 ST)
COLLEGE AVE
ISABELLA ST (104 AVE)
CLARA ST (103 AVE)
MAY ST (102A AVE)
HOWARD AVE (100A ST)
MC DONALD AVE (100 ST)
ELIZABETH ST (102 AVE)
RICE ST (101A AVE)
JASPER AVE EAST
DAVID ST
(MC DONALD DRIVE)
QUEENS AVE (99 ST)
FRASER AVE (98 ST)
NAMAYO AVE (97 ST)
KINISTINO AVE (96 ST)
ISABELLA ST (104 AVE)
BOYLE ST (103A AVE)
CLARA ST (103 AVE)
BELLAMY ST (102A AVE)
ELIZABETH ST (102 AVE)
RICE ST (101A AVE)
JASPER AVE EAST
GRIERSON ST

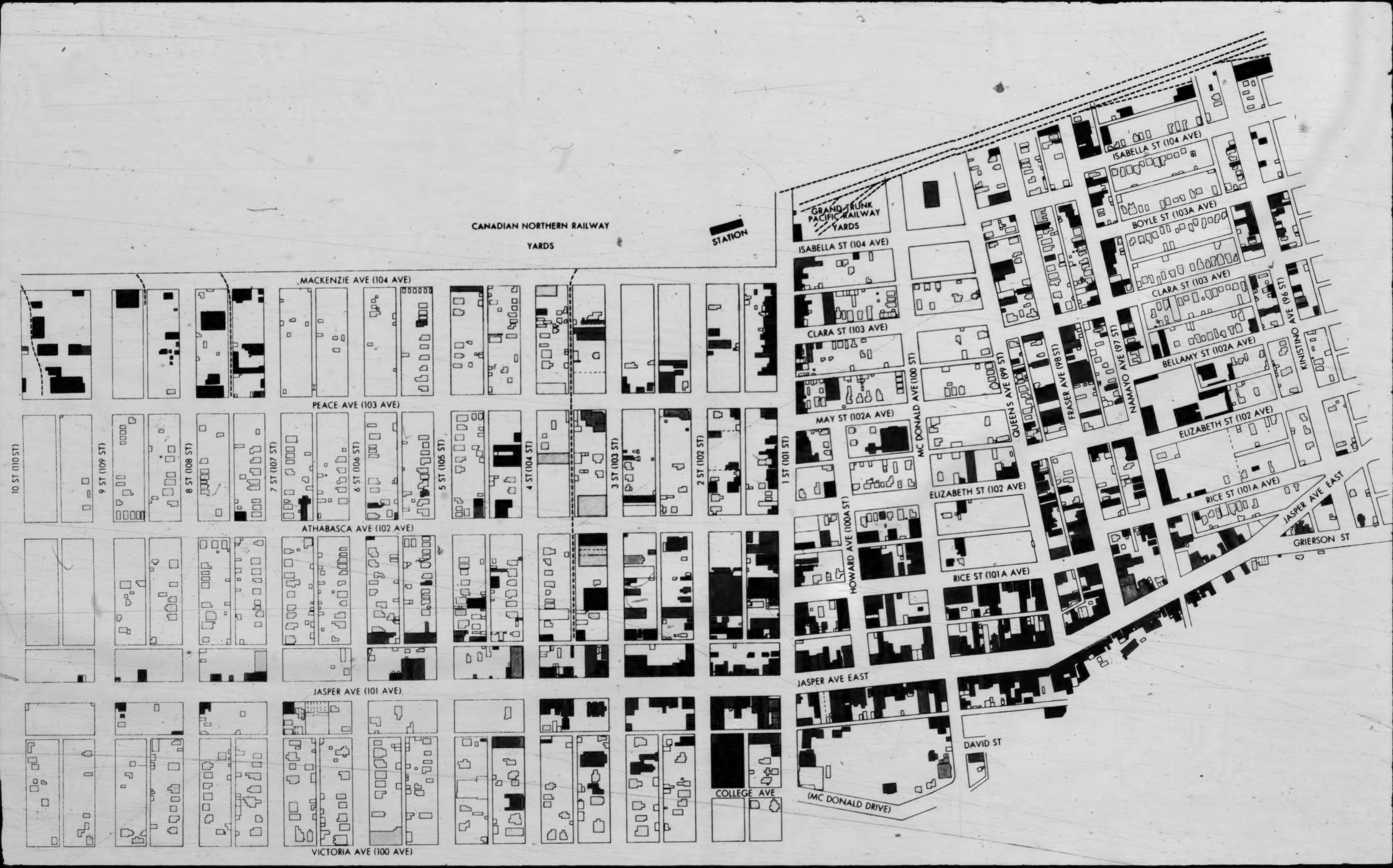
Figure 5.2

Ground - Floor Use

1911 (December)

BUILDING USES

- ■ Commercial Service
- ■ Retail Service
- □ Private Residence
- ▨ Apartment
- ▨ Boarding House and Hotel
- ■ Institution (Public and Semi Public)
- ▨ Wholesale Warehousing
- ■ Warehousing, Storage, Transportation and Utilities
- ▨ Industry Non Manufacturing
- ■ Manufacturing
- ▨ Clubs and Halls
- □ Vacant or Under Construction


CANADIAN NORTHERN RAILWAY
YARDS
STATION
GRAND TRUNK PACIFIC RAILWAY YARDS
ISABELLA ST (104 AVE)
ISABELLA ST (104 AVE)
MACKENZIE AVE (104 AVE)
BOYLE ST (103A AVE)
CLARA ST (103 AVE)
CLARA ST (103 AVE)
PEACE AVE (103 AVE)
BELLAMY ST (102A AVE)
MAY ST (102A AVE)
ELIZABETH ST (102 AVE)
ELIZABETH ST (102 AVE)
ATHABASCA AVE (102 AVE)
RICE ST (101A AVE)
RICE ST (101A AVE)
JASPER AVE EAST
JASPER AVE EAST
GRIERSON ST
JASPER AVE (101 AVE)
DAVID ST
COLLEGE AVE
(MC DONALD DRIVE)
VICTORIA AVE (100 AVE)
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HOWARD AVE (100A ST)
MC DONALD AVE (100 ST)
QUEENS AVE (99 ST)
FRASER AVE (98 ST)
NAMAYO AVE (97 ST)
KINISTINO AVE (96 ST)

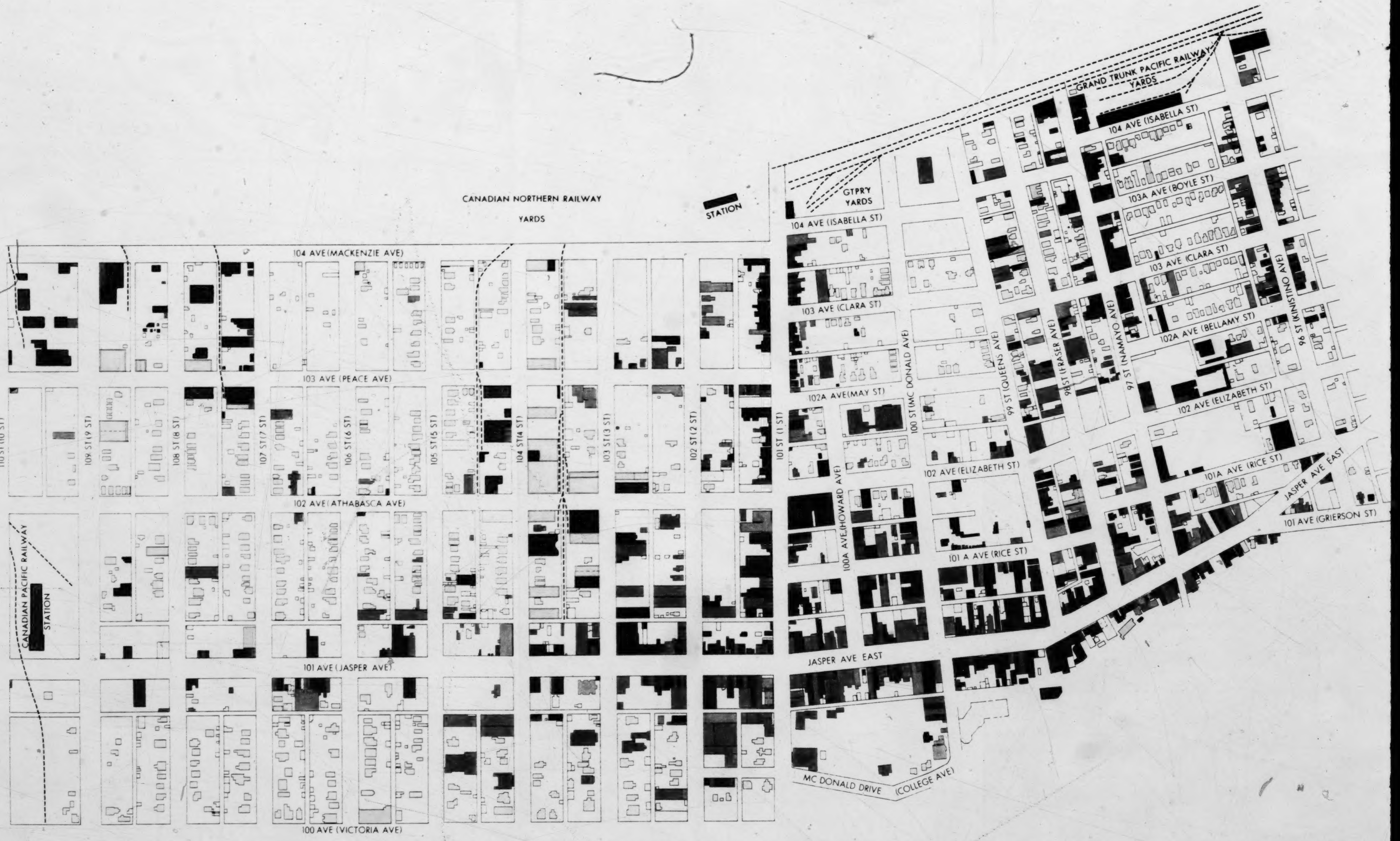
Figure 5.3

Ground - Floor Use

1914 (August)

BUILDING USES

- ■ Commercial Service
- ■ Retail Service
- □ Private Residence
- ▨ Apartment
- ▩ Boarding House and Hotel
- ■ Institution (Public and Semi Public)
- □ Wholesale Warehousing
- ■ Warehousing, Storage, Transportation and Utilities
- ▩ Industry Non Manufacturing
- ■ Manufacturing
- ▩ Clubs and Halls
- □ Vacant or Under Construction



CANADIAN NORTHERN RAILWAY
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GTPR'Y
YARDS
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104 AVE (ISABELLA ST)
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(COLLEGE AVE)
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97 ST (NAMAYO AVE)
96 ST (KINISTINO AVE)
CANADIAN PACIFIC RAILWAY
STATION

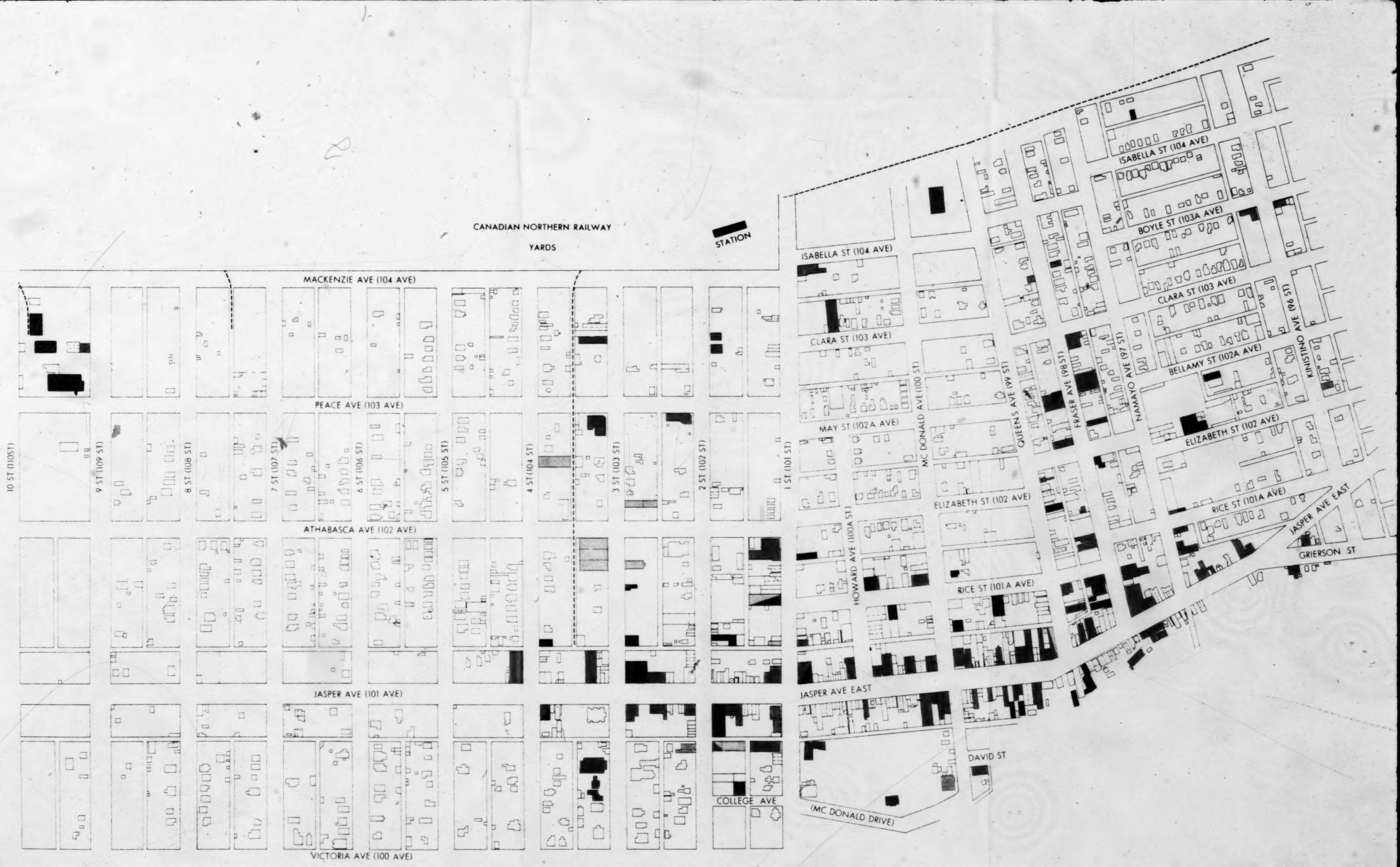
Figure 5.4

Above Ground - Floor Use

1907 (Spring)

BUILDING USES

- ■ Commercial Service
- ■ Retail Service
- □ Private Residence
- ▒ Apartment
- ▨ Boarding House and Hotel
- ■ Institution (Public and Semi Public)
- □ Wholesale Warehousing
- ■ Warehousing, Storage, Transportation and Utilities
- ▨ Industry Non Manufacturing
- ■ Manufacturing
- ▒ Clubs and Halls


CANADIAN NORTHERN RAILWAY
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MC DONALD AVE (100 ST)
ELIZABETH ST (102 AVE)
RICE ST (101A AVE)
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(MC DONALD DRIVE)
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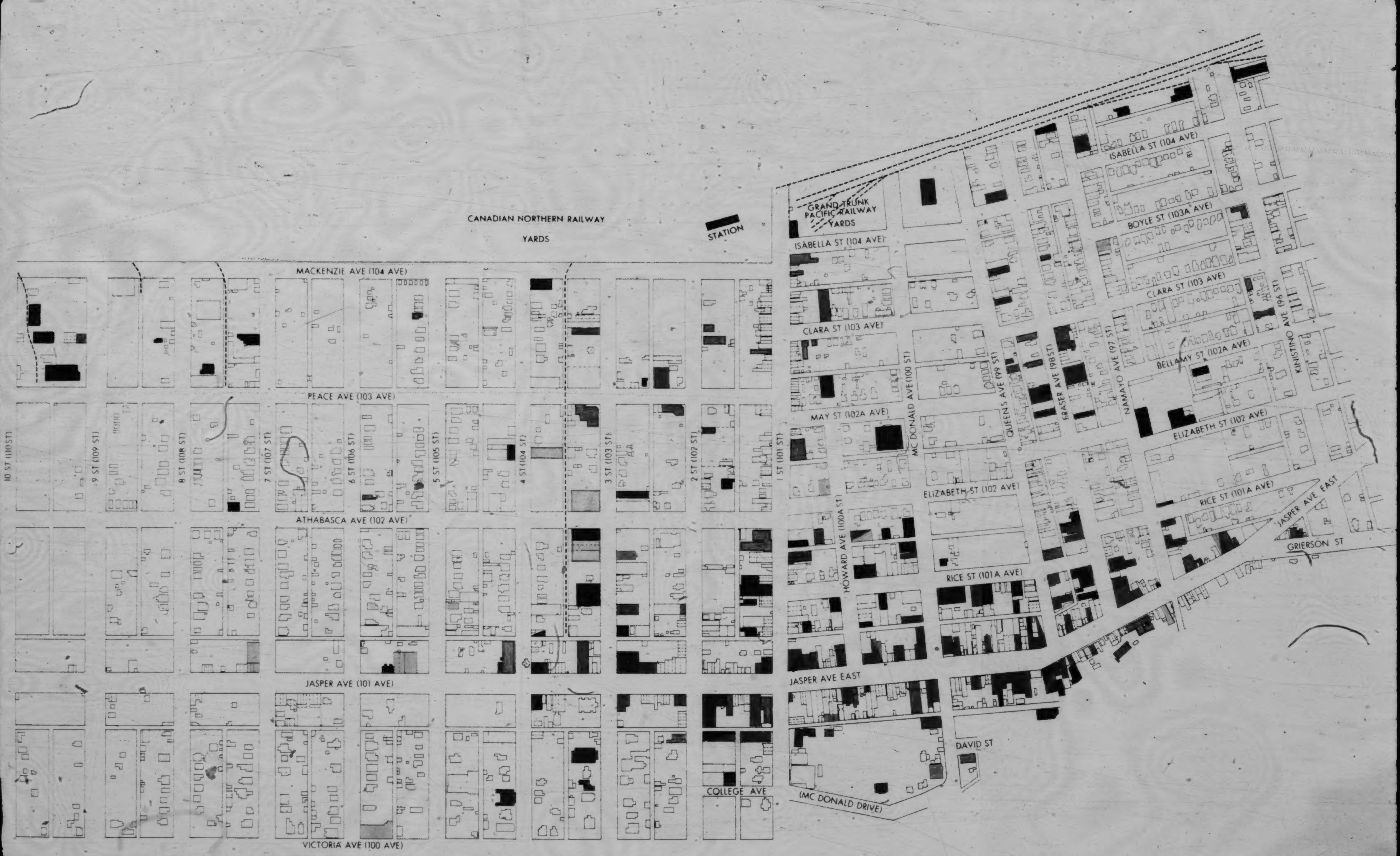
BOYLE ST (103A AVE)
CLARA ST (103 AVE)
BELLAMY ST (102A AVE)
ELIZABETH ST (102 AVE)
RICE ST (101A AVE)
JASPER AVE EAST
GRIERSON ST

Figure 5.5

Above Ground - Floor Use
1911 (December)

BUILDING USES

- ■ Commercial Service
- ■ Retail Service
- □ Private Residence
- ▨ Apartment
- ▨ Boarding House and Hotel
- ■ Institution (Public and Semi Public)
- □ Wholesale Warehousing
- ■ Warehousing, Storage, Transportation and Utilities
- ▨ Industry Non Manufacturing
- ■ Manufacturing
- ▨ Clubs and Halls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BELLAMY ST (102A AVE)
ELIZABETH ST (102 AVE)
RICE ST (101A AVE)
JASPER AVE EAST
GRIERSON ST

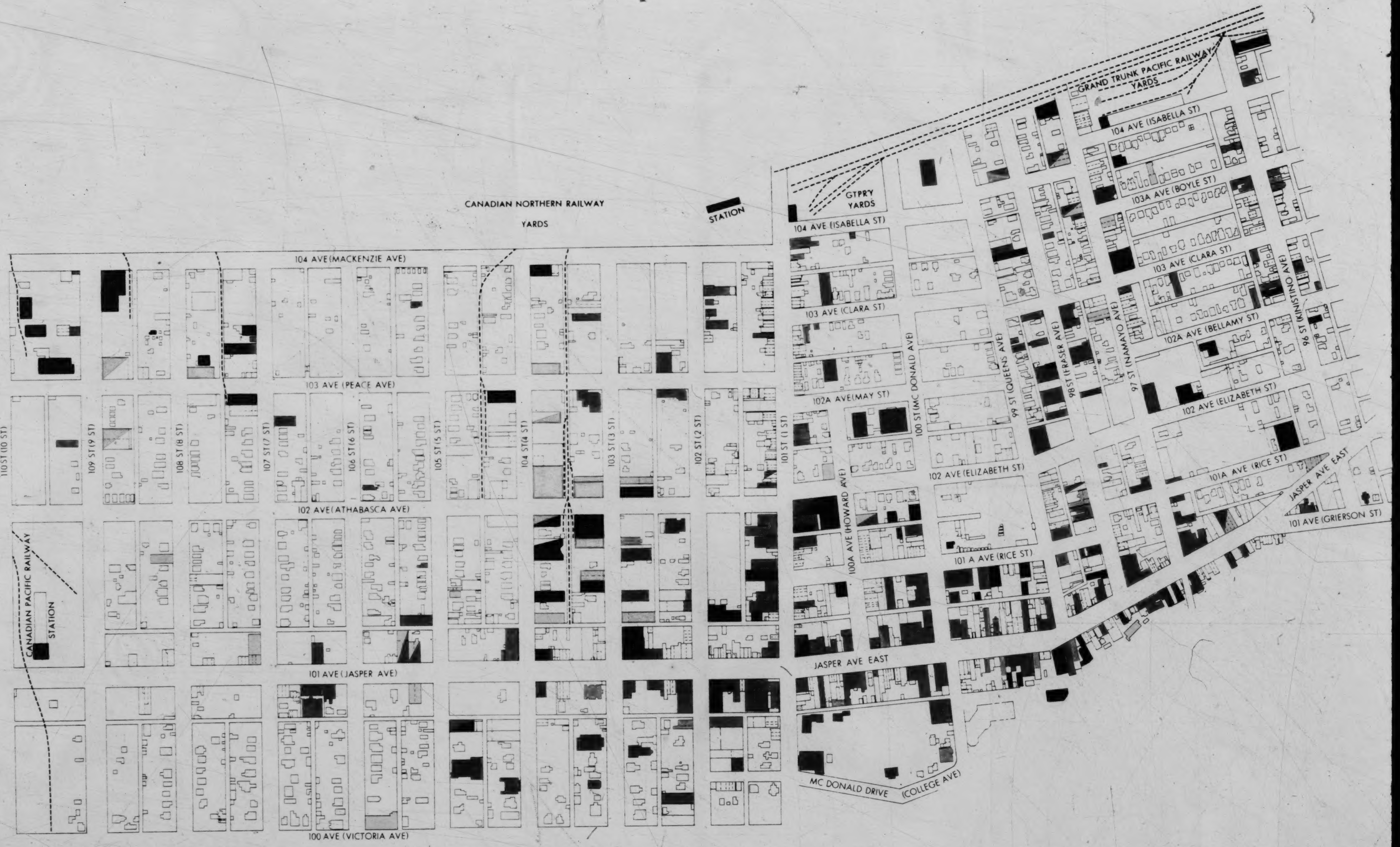
Figure 5.6

Above Ground - Floor Use

1914 (August)

BUILDING USES

■ Commercial Service
■ Retail Service
□ Private Residence
▨ Apartment
■ Boarding House and Hotel
■ Institution (Public and Semi Public)
▨ Wholesale Warehousing
■ Warehousing, Storage, Transportation and Utilities
▨ Industry Non Manufacturing
■ Manufacturing
▨ Clubs and Halls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97 ST (NAMAYO AVE)
96 ST (KINISTINO AVE)
CANADIAN PACIFIC RAILWAY
STATION

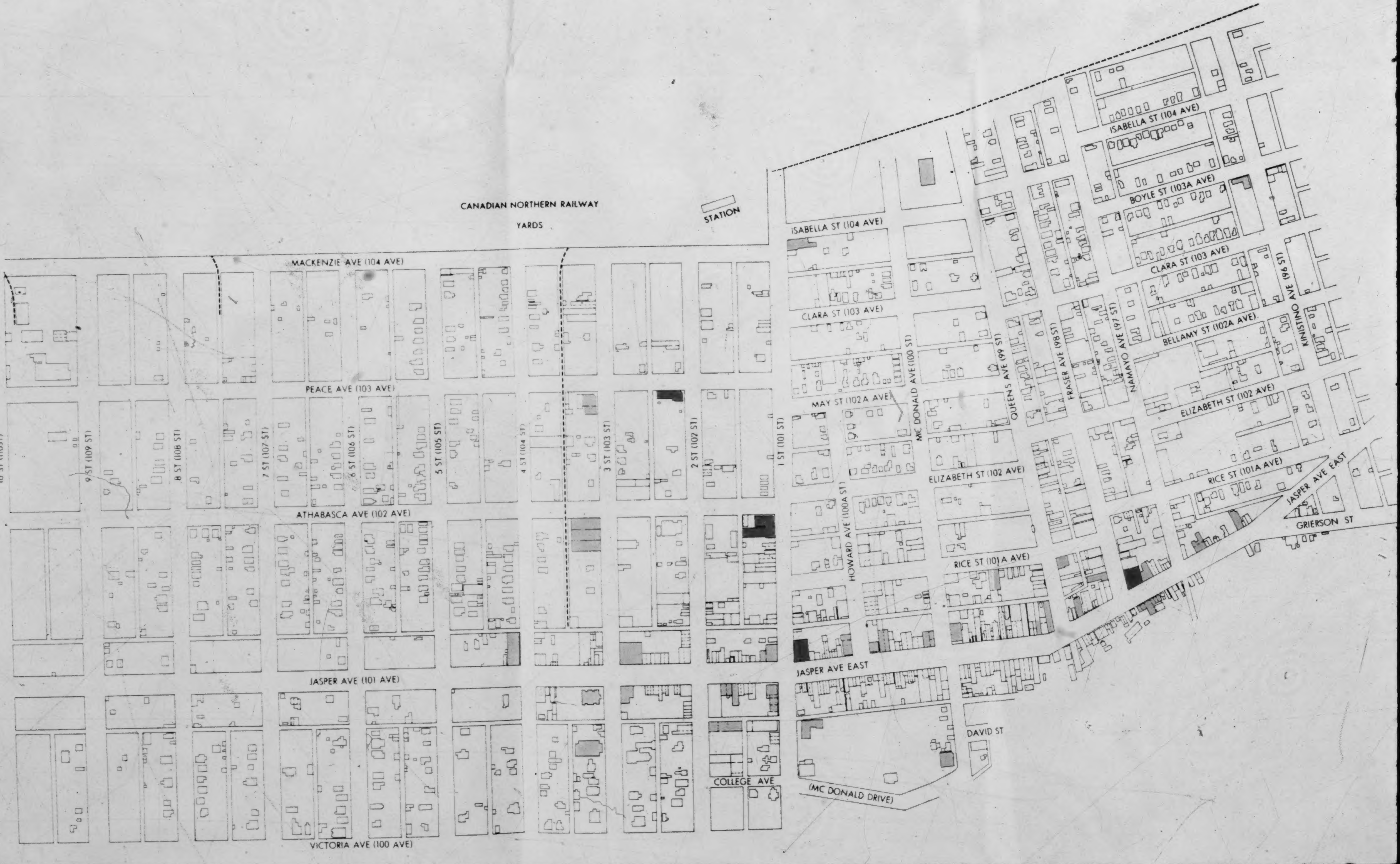
Figure 5.7

BUILDING HEIGHT

1907 (February)

BUILDING HEIGHT

- ░ Buildings of 3 to 3 1/2 storeys
- ▓ Buildings of 4 to 4 1/2 storeys
- █ Buildings of 5 or more storeys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BELLAMY ST (102A AVE)
ELIZABETH ST (102 AVE)
RICE ST (101A AVE)
JASPER AVE EAST
GRIERSON ST

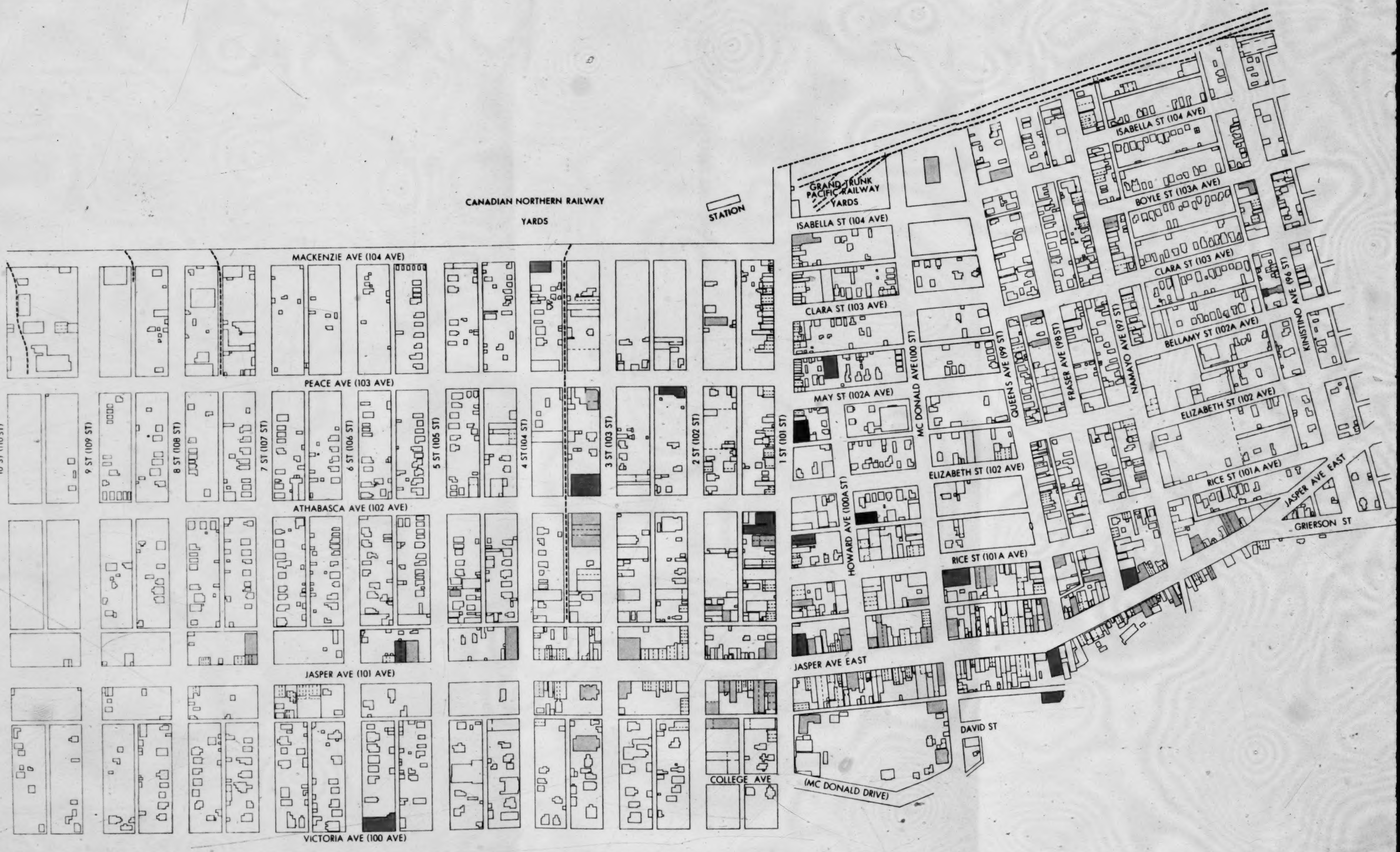
Figure 5.8

BUILDING HEIGHT

1911 (December)

BUILDING HEIGHT

░ Buildings of 3 to 3 1/2 storeys
▓ Buildings of 4 to 4 1/2 storeys
█ Buildings of 5 or more storeys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BELLAMY ST (102A AVE)
ELIZABETH ST (102 AVE)
RICE ST (101A AVE)
JASPER AVE EAST
GRIERSON ST

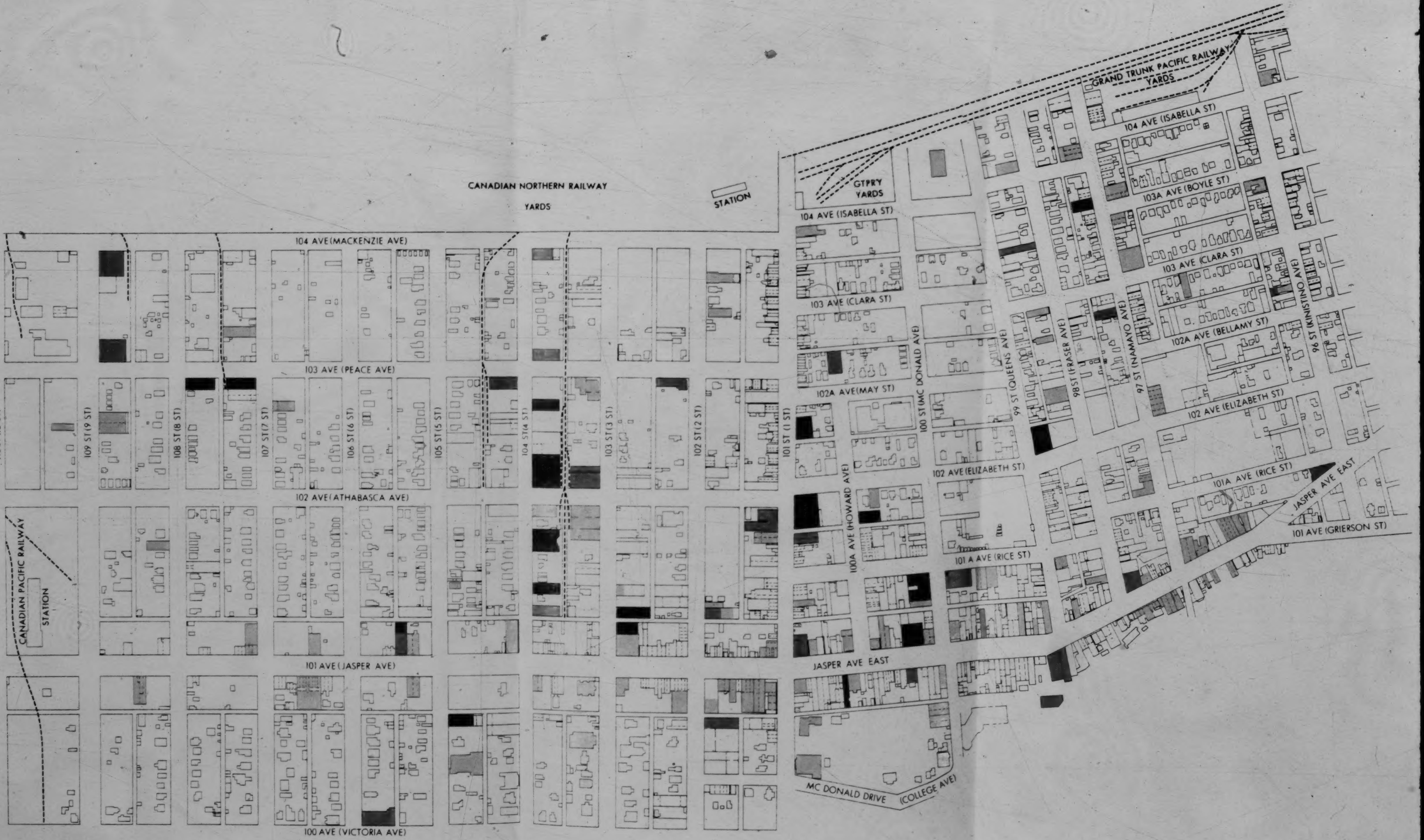
Figure 5.9

BUILDING HEIGHT

1914 (August)

BUILDING HEIGHT

- ░ Buildings of 3 to 3 1/2 storeys
- ▓ Buildings of 4 to 4 1/2 storeys
- ■ Buildings of 5 or more storeys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CANADIAN PACIFIC RAILWAY
STATION
GTP R'Y
YARDS
104 AVE (ISABELLA ST)
103 AVE (CLARA ST)
102A AVE (MAY ST)
100A AVE (HOWARD AVE)
100 ST (MC DONALD AVE)
102 AVE (ELIZABETH ST)
101 A AVE (RICE ST)
JASPER AVE EAST
MC DONALD DRIVE
(COLLEGE AVE)
99 ST (QUEENS AVE)
98 ST (FRASER AVE)
97 ST (NAMAYO AVE)
96 ST (KINISTINO AVE)
GRAND TRUNK PACIFIC RAILWAY
YARDS
104 AVE (ISABELLA ST)
103A AVE (BOYLE ST)
103 AVE (CLARA ST)
102A AVE (BELLAMY ST)
102 AVE (ELIZABETH ST)
101A AVE (RICE ST)
JASPER AVE EAST
101 AVE (GRIERSON ST)

Figure 5.10

BUILDING MATERIALS

1907 (February)

BUILDING MATERIALS

■ Brick or concrete construction

▣ Wood construction with a brick covering or facade

□ Wood construction and wood construction metal clad

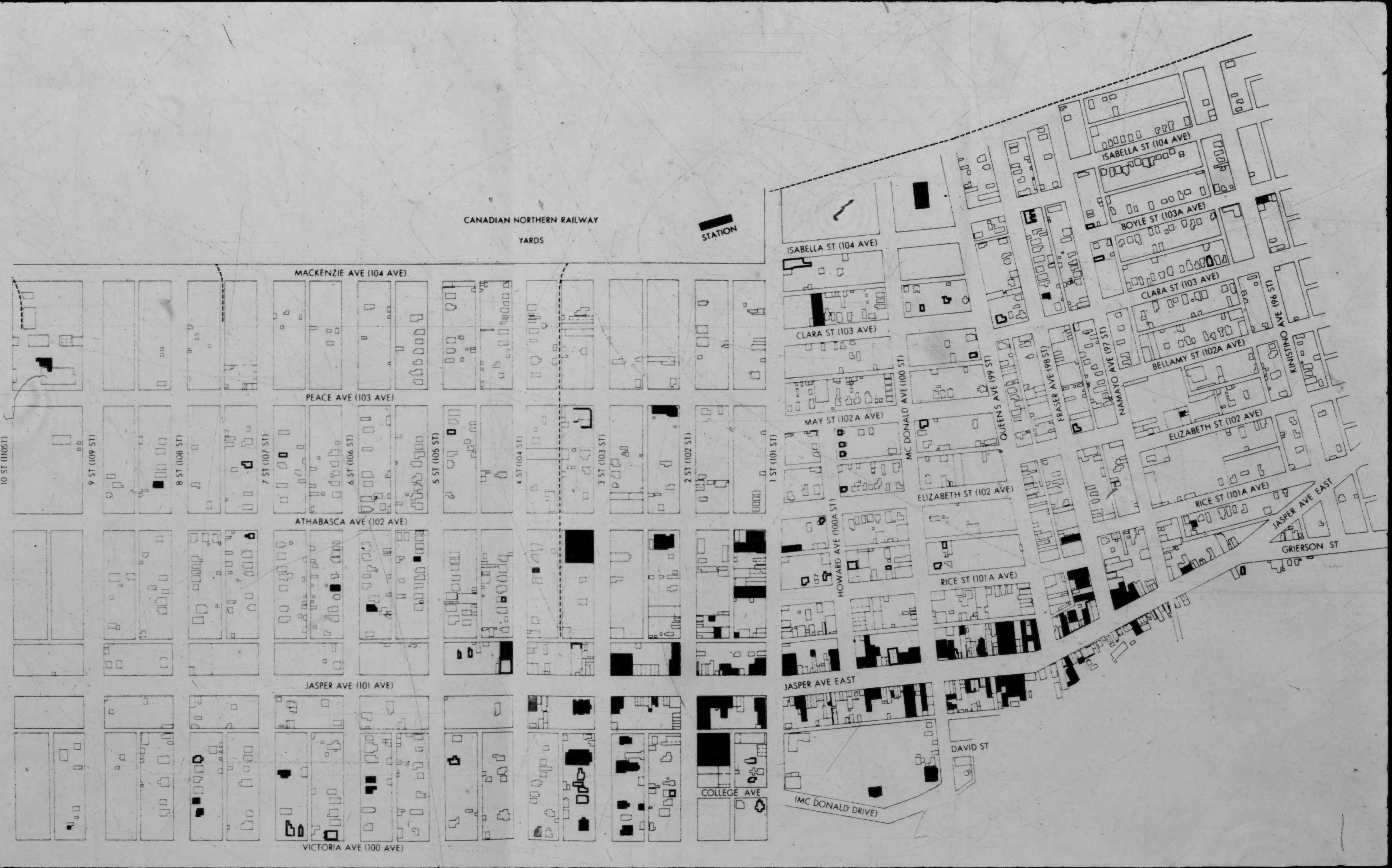

CANADIAN NORTHERN RAILWAY
YARDS
STATION
MACKENZIE AVE (104 AVE)
ISABELLA ST (104 AVE)
ISABELLA ST (104 AVE)
BOYLE ST (103A AVE)
CLARA ST (103 AVE)
CLARA ST (103 AVE)
BELLAMY ST (102A AVE)
KINISTINO AVE (96 ST)
PEACE AVE (103 AVE)
MAY ST (102A AVE)
MC DONALD AVE (100 ST)
QUEENS AVE (99 ST)
FRASER AVE (98 ST)
NAMAYO AVE (97 ST)
ELIZABETH ST (102 AVE)
ELIZABETH ST (102 AVE)
10 ST (110ST)
9 ST (109 ST)
8 ST (108 ST)
7 ST (107 ST)
6 ST (106 ST)
5 ST (105 ST)
4 ST (104 ST)
3 ST (103 ST)
2 ST (102 ST)
1 ST (101 ST)
RICE ST (101A AVE)
HOWARD AVE (100A ST)
ATHABASCA AVE (102 AVE)
JASPER AVE EAST
GRIERSON ST
RICE ST (101A AVE)
JASPER AVE (101 AVE)
JASPER AVE EAST
DAVID ST
COLLEGE AVE
(MC DONALD DRIVE)
VICTORIA AVE (100 AVE)

Figure 5.11

BUILDING MATERIALS

1911 (December)

BUILDING MATERIALS

■ Brick or concrete construction

▣ Wood construction with a brick covering or facade

□ Wood construction and wood construction metal clad

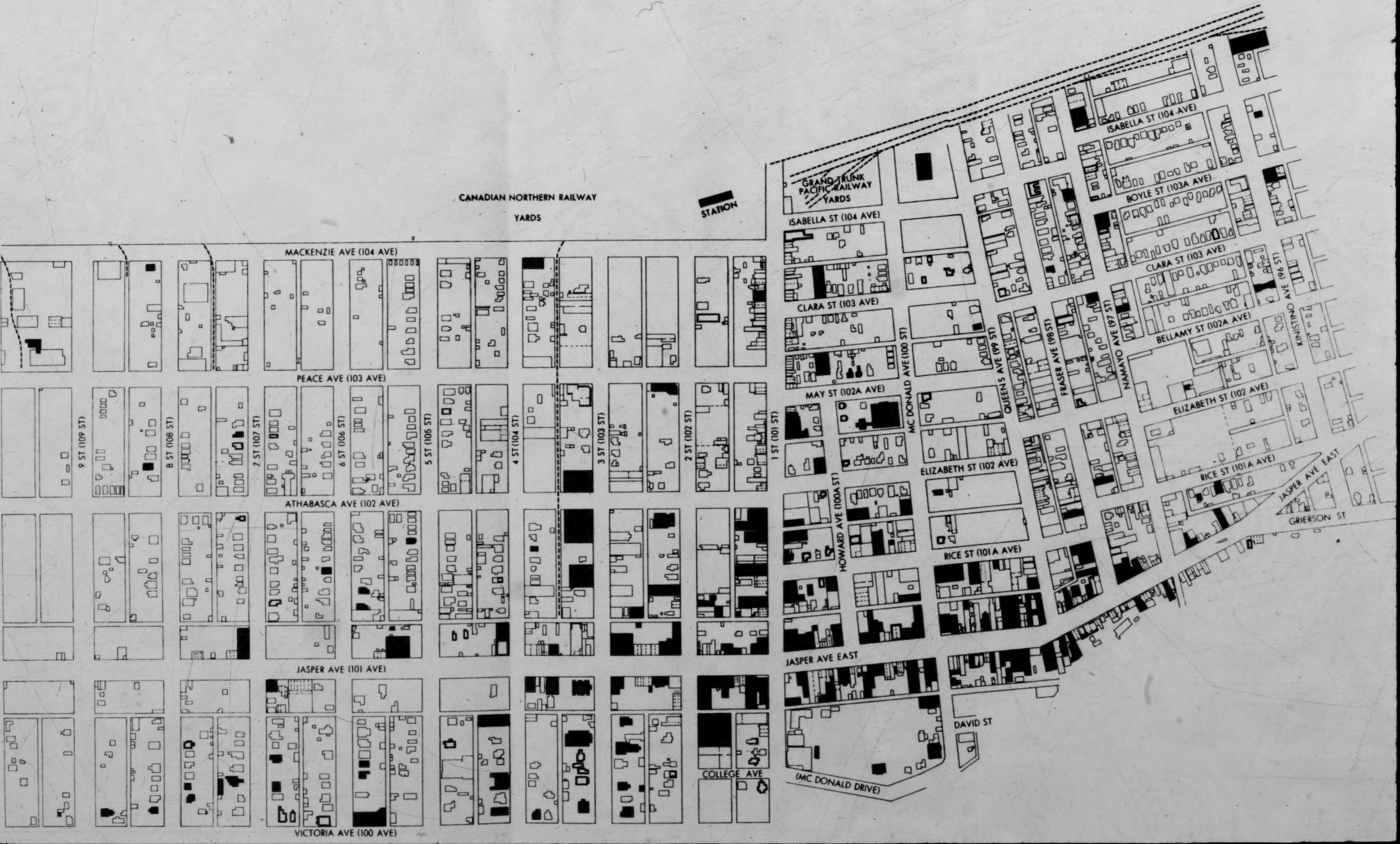

CANADIAN NORTHERN RAILWAY
YARDS
STATION
GRAND TRUNK PACIFIC RAILWAY YARDS
MACKENZIE AVE (104 AVE)
PEACE AVE (103 AVE)
ATHABASCA AVE (102 AVE)
JASPER AVE (101 AVE)
VICTORIA AVE (100 AVE)
COLLEGE AVE
9 ST (109 ST)
8 ST (108 ST)
7 ST (107 ST)
6 ST (106 ST)
5 ST (105 ST)
4 ST (104 ST)
3 ST (103 ST)
2 ST (102 ST)
1 ST (101 ST)
ISABELLA ST (104 AVE)
CLARA ST (103 AVE)
MAY ST (102A AVE)
ELIZABETH ST (102 AVE)
RICE ST (101A AVE)
JASPER AVE EAST
DAVID ST
(MC DONALD DRIVE)
HOWARD AVE (100A ST)
MC DONALD AVE (100 ST)
QUEENS AVE (99 ST)
FRASER AVE (98 ST)
NAMAYO AVE (97 ST)
KINISTINO AVE (96 ST)
ISABELLA ST (104 AVE)
BOYLE ST (103A AVE)
CLARA ST (103 AVE)
BELLAMY ST (102A AVE)
ELIZABETH ST (102 AVE)
RICE ST (101A AVE)
JASPER AVE EAST
GRIERSON ST

Figure 5.12

BUILDING MATERIALS

1914 (August)

BUILDING MATERIALS

■ Brick or concrete construction
▣ Wood construction with a brick covering or facade
□ Wood construction and wood construction metal clad

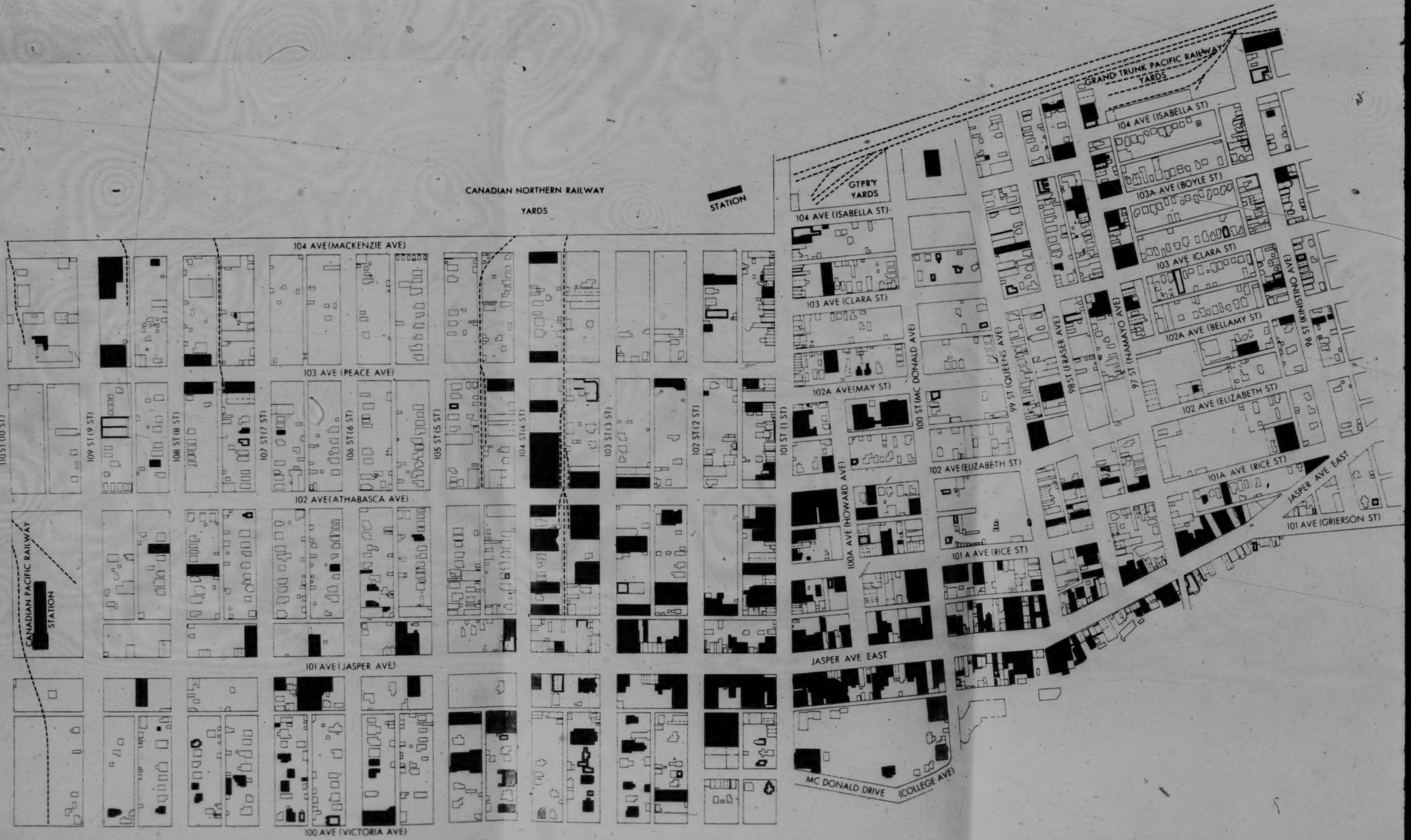
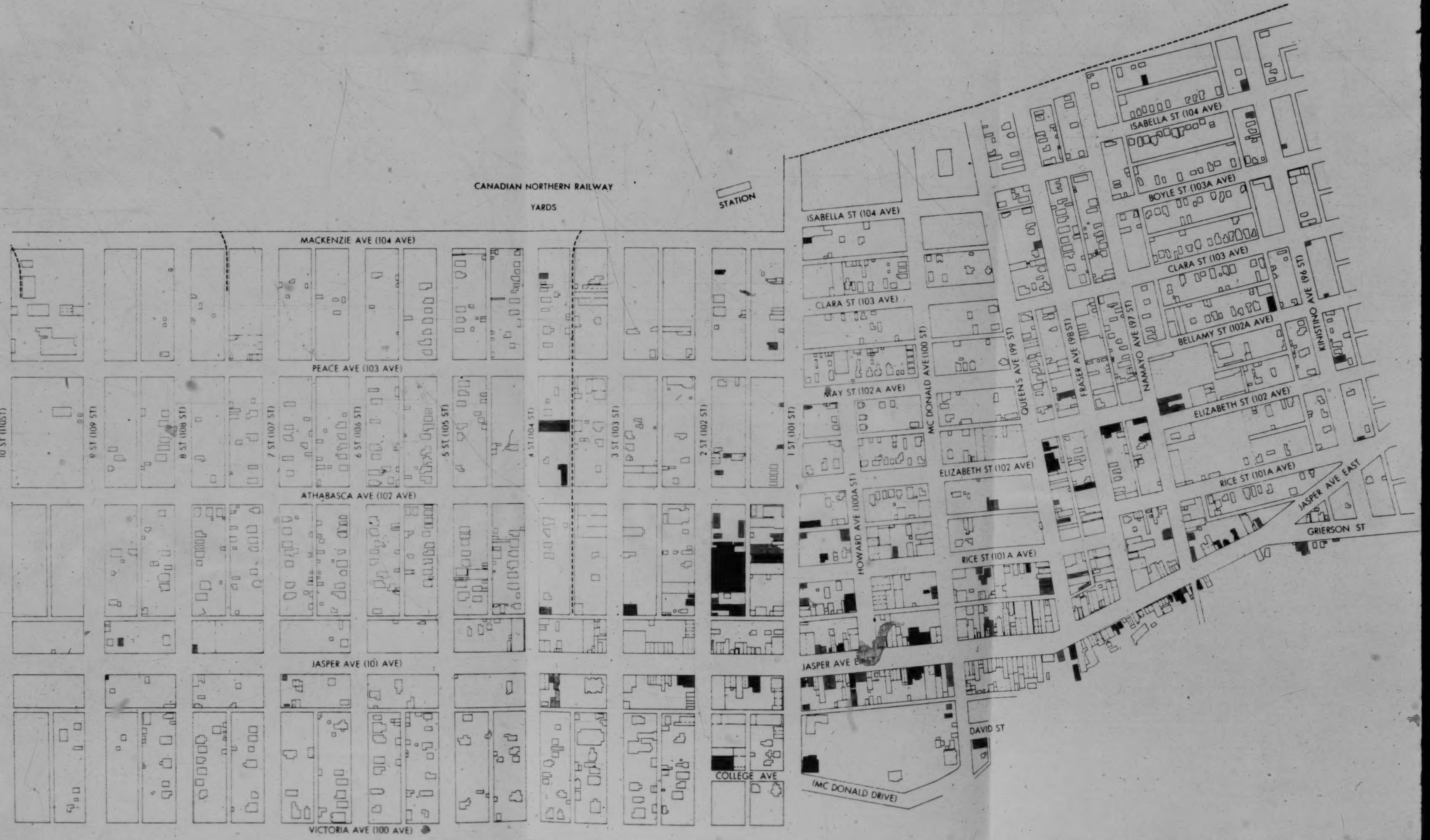

CANADIAN NORTHERN RAILWAY
YARDS
STATION
GRAND TRUNK PACIFIC RAILWAY
YARDS
GTPR'Y
YARDS
104 AVE (ISABELLA ST)
104 AVE (MACKENZIE AVE)
103 AVE (PEACE AVE)
102 AVE (ATHABASCA AVE)
101 AVE (JASPER AVE)
100 AVE (VICTORIA AVE)
110 ST (10 ST)
109 ST (9 ST)
108 ST (8 ST)
107 ST (7 ST)
106 ST (6 ST)
105 ST (5 ST)
104 ST (4 ST)
103 ST (3 ST)
102 ST (2 ST)
101 ST (1 ST)
CANADIAN PACIFIC RAILWAY
STATION
103 AVE (CLARA ST)
102A AVE (MAY ST)
100 ST (MC DONALD AVE)
100A AVE (HOWARD AVE)
102 AVE (ELIZABETH ST)
101 A AVE (RICE ST)
JASPER AVE EAST
MC DONALD DRIVE
(COLLEGE AVE)
99 ST (QUEENS AVE)
98 ST (FRASER AVE)
97 ST (NAMAYO AVE)
96 ST (KINISTINO AVE)
104 AVE (ISABELLA ST)
103A AVE (BOYLE ST)
103 AVE (CLARA ST)
102A AVE (BELLAMY ST)
102 AVE (ELIZABETH ST)
101A AVE (RICE ST)
JASPER AVE EAST
101 AVE (GRIERSON ST)

Figure 5.13

DEMOLITION OF THE 1907 BUILDING STOCK

▨ Buildings of 1907 demolished between 1907 and 1911

■ Buildings of 1907 demolished between 1911 and 1914


CANADIAN NORTHERN RAILWAY
YARDS
STATION
MACKENZIE AVE (104 AVE)
PEACE AVE (103 AVE)
ATHABASCA AVE (102 AVE)
JASPER AVE (101 AVE)
VICTORIA AVE (100 AVE)
10 ST (110ST)
9 ST (109 ST)
8 ST (108 ST)
7 ST (107 ST)
6 ST (106 ST)
5 ST (105 ST)
4 ST (104 ST)
3 ST (103 ST)
2 ST (102 ST)
1 ST (101 ST)
COLLEGE AVE
(MC DONALD DRIVE)
ISABELLA ST (104 AVE)
CLARA ST (103 AVE)
MAY ST (102A AVE)
ELIZABETH ST (102 AVE)
RICE ST (101A AVE)
JASPER AVE EAST
DAVID ST
HOWARD AVE (100A ST)
MC DONALD AVE (100 ST)
QUEENS AVE (99 ST)
FRASER AVE (98 ST)
NAMAYO AVE (97 ST)
KINISTINO AVE (96 ST)
ISABELLA ST (104 AVE)
BOYLE ST (103A AVE)
CLARA ST (103 AVE)
BELLAMY ST (102A AVE)
ELIZABETH ST (102 AVE)
RICE ST (101A AVE)
JASPER AVE EAST
GRIERSON ST